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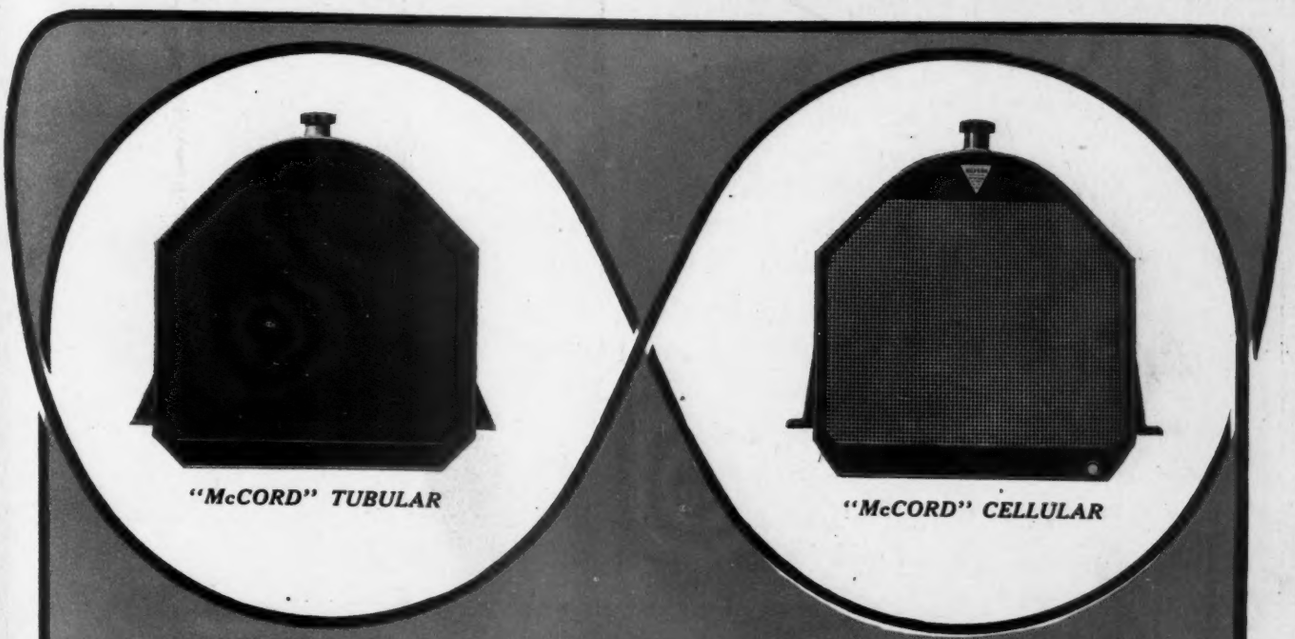
MOTOR AGE

VOLUME XXII CHICAGO, NOVEMBER 14, 1912 NUMBER 20



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MOTOR AGE

Published by the
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CHICAGO ILLINOIS

Volume XXII NOVEMBER 14, 1912 No. 20

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VOL. XXII, No. 20 CHICAGO, NOVEMBER 14, 1912 $3.00 PER YEAR

MOTOR AGE

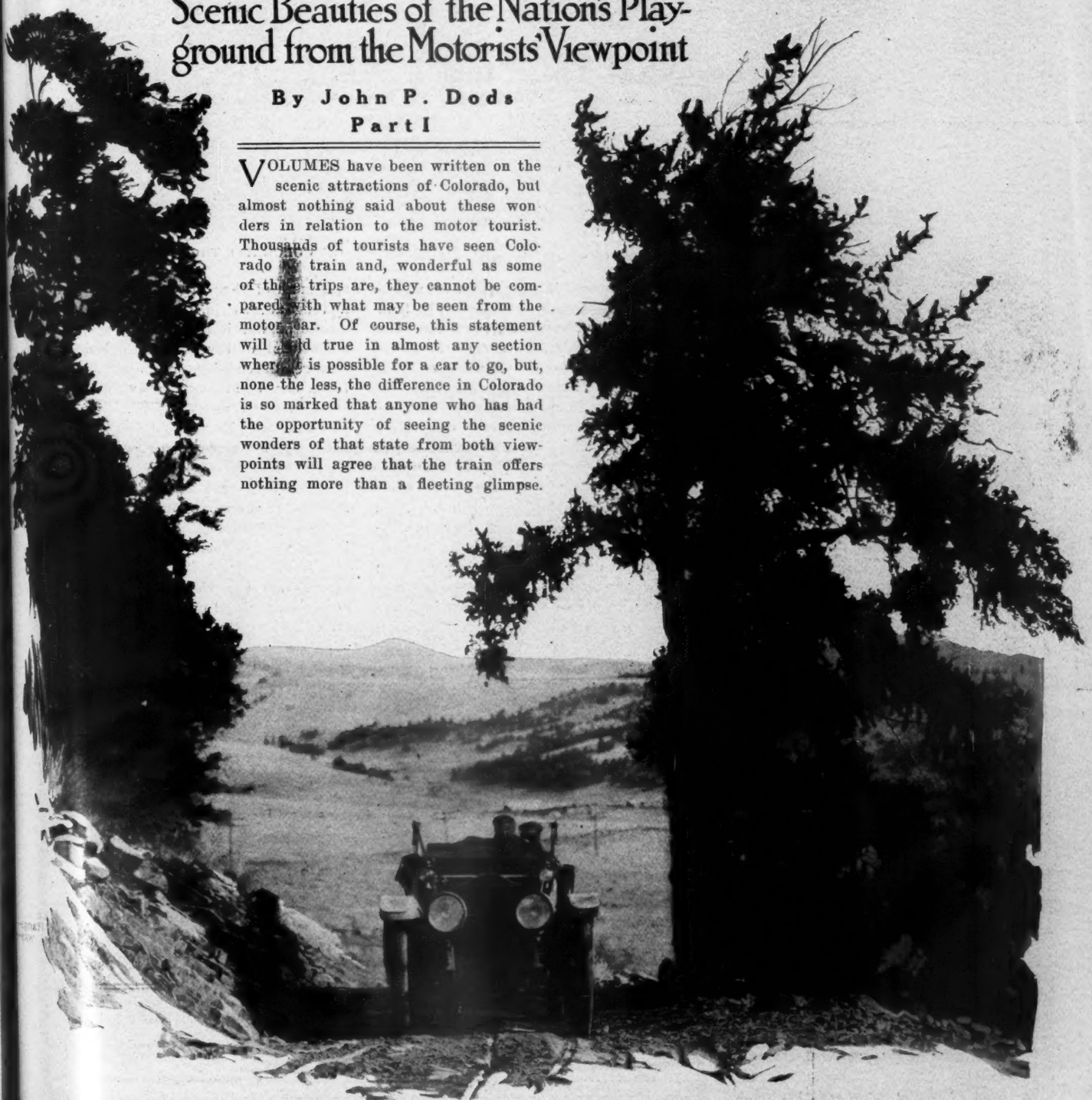
One Thousand Miles Through Colorado

Scenic Beauties of the Nation's Playground from the Motorists' Viewpoint

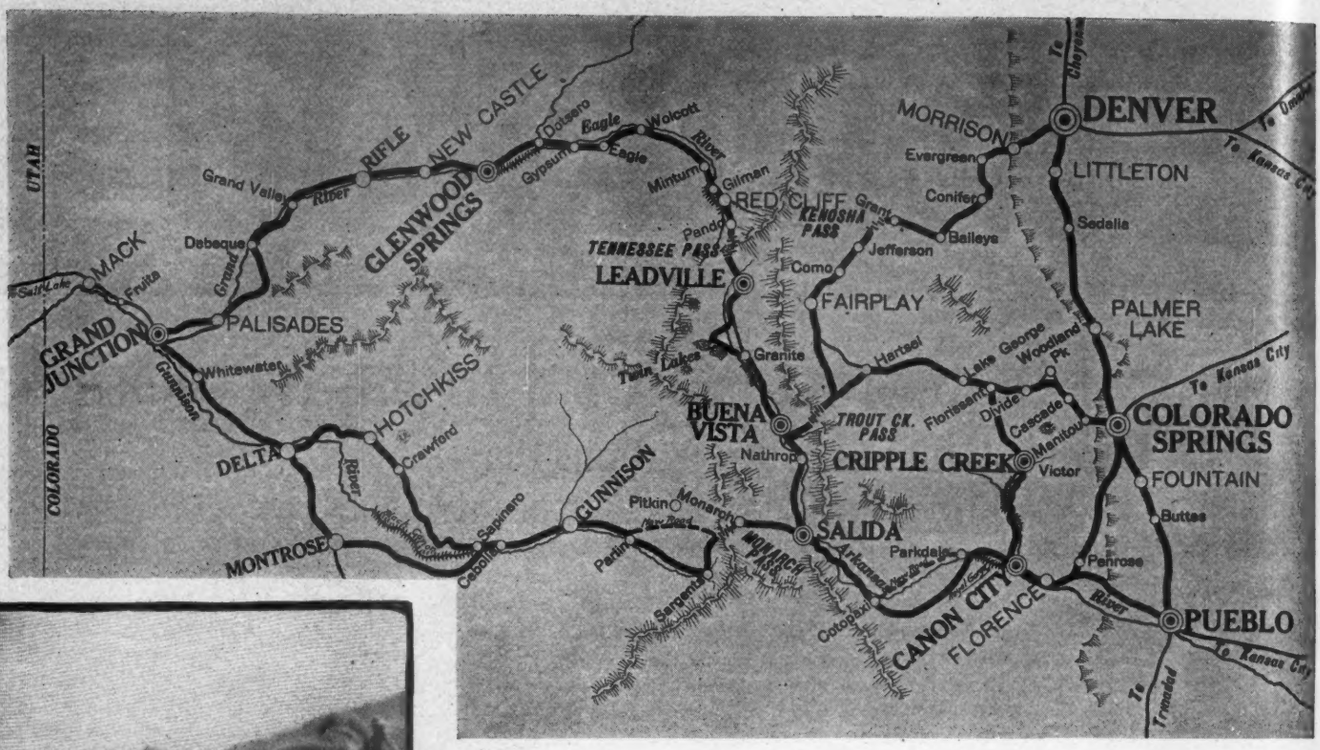
By John P. Dods

Part I

VOLUMES have been written on the scenic attractions of Colorado, but almost nothing said about these wonders in relation to the motor tourist. Thousands of tourists have seen Colorado by train and, wonderful as some of these trips are, they cannot be compared with what may be seen from the motor car. Of course, this statement will hold true in almost any section where it is possible for a car to go, but, none the less, the difference in Colorado is so marked that anyone who has had the opportunity of seeing the scenic wonders of that state from both viewpoints will agree that the train offers nothing more than a fleeting glimpse.



VIEW OF BUFFALO PEAK FROM TOP OF GRADE IN SOUTH PARK



MAP SHOWING ROUTE OF COLORADO TRIP

OUR FIRST COWBOY. GASOLINE AT GRANT

The number of canons, passes, gorges, roads, etc., that are open to motor travel are almost unlimited and the wonderful thing is that every one has some distinct feature that makes it almost entirely different from all others.

Surpass the Alps

Each day's journey will bring fresh and thrilling vistas. Nowhere, not even in the Alps, can the motorist view from his car canyons to compare with those of the Arkansas, the Gunnison or the Grand, nor can he view snow-capped peaks to equal those of the Saguche or Sangre de Cristo ranges. No other state has so much to offer the tourist in variety of scenery as has Colorado.

To those who have never seen the Rockies, it is impossible to picture, even with the best photographs, the mountain landscape of the rocks with their tremendous heights and depths. To every true American the motto See America First should call to him above all else and the car owner has an opportunity to see America which far surpasses every other means for tourist travel. There is something so big about these mountains of enormous heights with their snow caps that no one with red blood in his veins can see them and not feel the uplifting, inspiring influence. It has been truly said, Once see the Rockies in all their grandeur and you will always feel them drawing you back.

Some people who have the best interests not only of Colorado, but all North America at heart, wonder why it is that so many tourists flock abroad each summer, more and more of them in recent years making a tour abroad in their machines. The simple answer is accessibility and accommodations well advertised. These two features abroad have not only been well taken care of and advertised, but made an asset in every possible way. The tourist going through France or Switzerland finds not only wonderful road conditions and accommodations at frequent intervals, but that the people are catering to the tourist.

Touring Facilities Unknown

If careful inquiry is made into the subject it will be found that these two reasons are the most important in drawing tourists abroad, whereas most people believe that the real primary reason is scenic attractions. Attractive scenery is what might be called the talking point to get people into any section. But this cannot

SUGGESTED 8-DAY CIRCLE TOUR THROUGH COLORADO

ALTHOUGH the following schedule is possible, it is suggested that at least 2 weeks be allowed for the circle tour, if time can be spared, in order to take in more fully the many points of interest along the route. Some of the major points of interest are noted below.

1st Day—Denver to Buena Vista via Fairplay .....130.0 miles
Red Rocks Park—Bear Creek Canyon—South Platte Valley—Kenosha Pass — South Park — Trout Creek Canyon.

2nd Day—Buena Vista to Glenwood Springs .....132.5 miles
Arkansas Valley — Twin Lakes — Leadville Mines—Tennessee Pass—Eagle Canyon — Battle Mountain — Canyon of the Grand.

3rd Day—Glenwood Springs to Grand Junction .....132.5 miles
Grand Valley—Mesa Buttes—Palisades on Plateau Creek—Orchards.

4th Day—Grand Junction to Gunnison .....103.1 miles
Ride over Blue or Black Mesa—Black Canyon—Gunnison Valley—Curecanti Needle—Gunnison Tunnel.

5th Day—Gunnison to Canon City via Salida .....135.0 miles
Monarch Pass—Arkansas Valley—Sangre de Cristi Range.

6th Day—Royal Gorge and Skyline Drive in A. M. Canon City to Colorado Springs P. M.....48.2 miles
Skyline Drive—Royal Gorge—Dead Man's Gulch—Pike's Peak—Garden of the Gods—Crystal Park.

7th Day—Colorado Springs to Pueblo via Florrisant, Cripple Creek and Canon City.....122.2 miles
Manitou — Ute Pass — Rainbow Falls—Cripple Creek Mines—Phantom Canyon—Window Rock.

8th Day—Pueblo to Denver via Colorado Springs.....112.5 miles
Convict road along Front Range—View Pike's Peak all the way—Palmer Lake.

Total miles—922.6.

be used as an argument for Americans going abroad, as America has some of the most attractive and the greatest variety of scenery in the world. If this condition were admitted, then why the continued travel abroad? Simply because, as far as the motorist goes, the movement for good roads has made real progress, particularly in the Rocky mountain states, only during the last 18 months.

Two or 3 years ago it would have been something of a stunt to drive an automobile from Denver to Grand Junction, Colo.; today there are two or three routes open to the tourist and by next summer the needed improvement along these in certain sections will put them on a par with other good roads in America.

Surfaced With Granite

Although not macadam, a considerable part of them are surfaced with decomposed granite or a hard shale clay, either one of which withstands wet weather remarkably well. Most of the cliff roads, i. e., roads literally cut out of the mountain side and almost overhanging a river anywhere from 25 to 2,000 feet below, either have turn-outs at very frequent intervals or are made sufficiently wide to allow passing at any point.

There are a great many such roads in

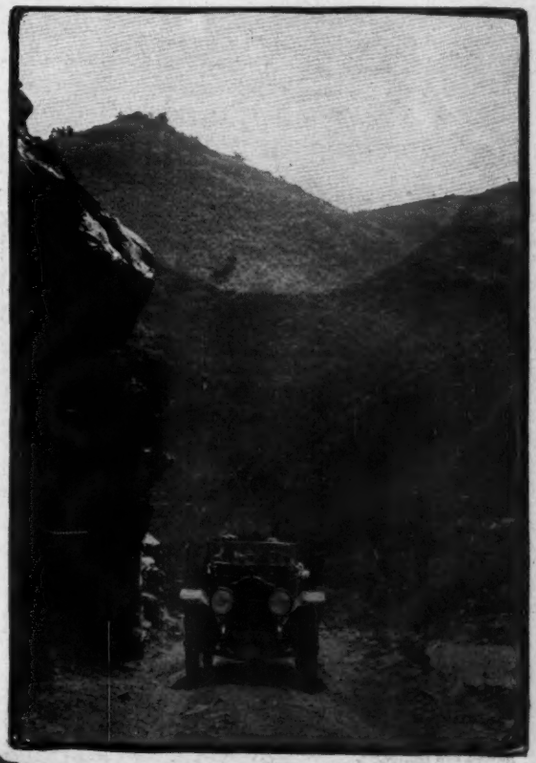
THE REASON OF THE TRIP AND WHAT WAS FOUND

THIS is the first installment of a series describing a tour covering 1,000 miles through Colorado from Denver to the Utah line and return over a different route. This week's installment covers the first 2 days of the trip, that is from Denver to Leadville. Other installments will be published in succeeding issues. The author, John P. Dods, of the Automobile Blue Book, gathered complete road information over the whole of the route and gives his impressions of the country as a touring ground for motorists.

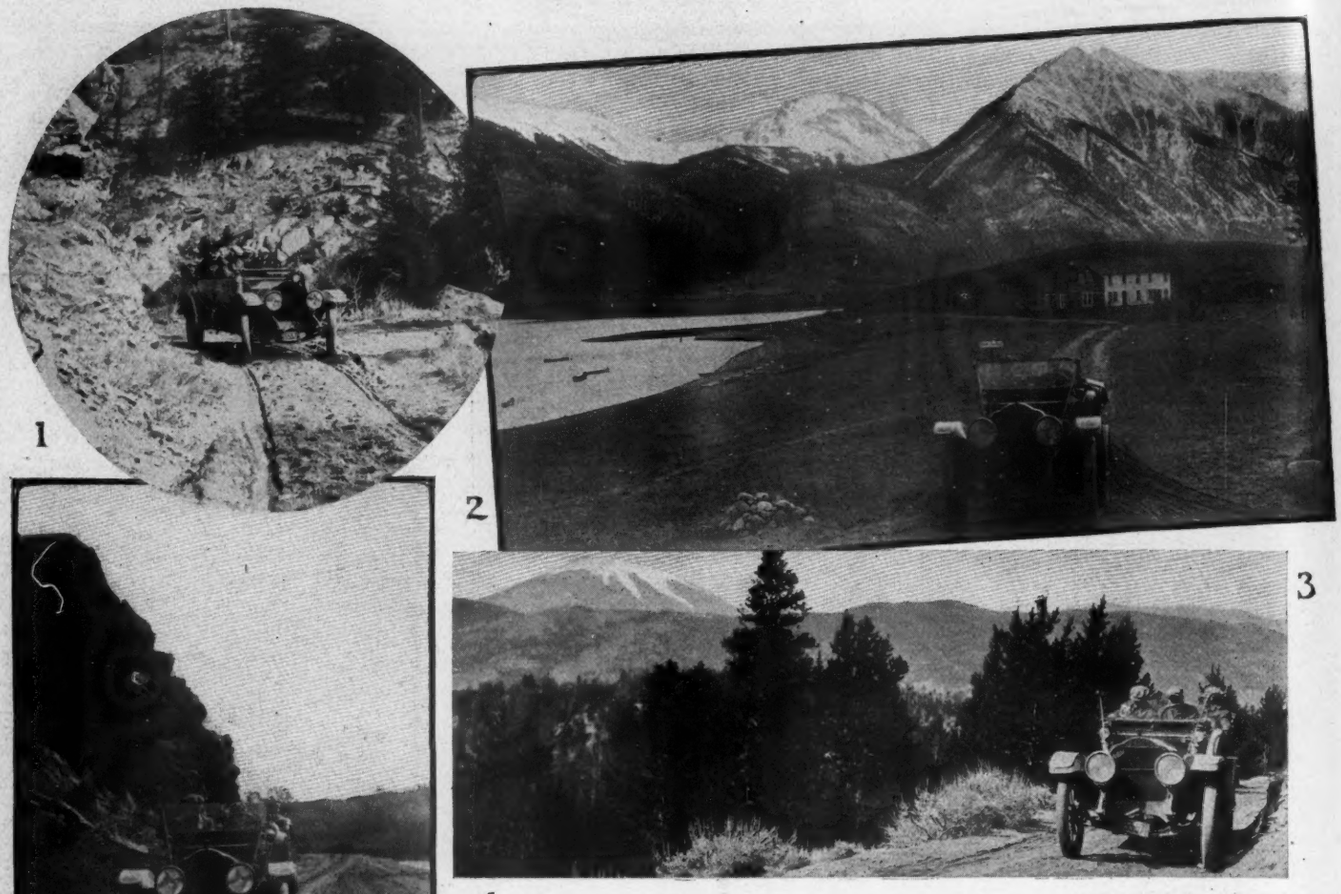
For more than a year people familiar with the good roads movement in Colorado have wondered what it would open up for the motorist in the way of scenic tours. As correspondence did not bring any definite information the Automobile Blue Book decided to investigate and, in cooperation with the White Co., organized a party which spent 2 weeks gathering road data in Colorado, procuring 450 photographs of the most wonderful scenery in the world accessible to the motor car. The party found that with a total population in the state of less than 600,000, Coloradoans have accomplished in 18 months what most other states have been trying to do for 5 years. A large factor in this work has been the success of the convict labor placed on the roads under Warden Tynan.

It was proven beyond a doubt that Colorado is ready for the motor tourist and can show him more mountain vistas, snow caps, gorges, canyons and peculiar rock formations than any other section. The trip served to give renewed enthusiasm to the people all along the Circle tour which will not only bring even better roads along the route described, but open many new sections for 1914 never before traveled by the motorist.

Above all else, it brings home as never before how little we know of what "See America First" really means. This phrase should be the watchword of every car owner, for within 3 years each Rocky mountain state will have hundreds of miles of roads for the motorist to run over.



RIGHT—JUST AFTER ENTERING BEAR CREEK CANYON AT MORRISON. LEFT—A SAMPLE OF THE SIGNPOSTS ERECTED BY UNITED STATES FOREST SERVICE. CENTER— BRIDGE IN BEAR CREEK CANYON



1—COMMENCING THE REAL CLIMB OUT OF BEAR CREEK CANYON. 2—ON SHORE OF TWIN LAKES WITH TWIN PEAKS IN BACKGROUND. 3—A VIEW FROM THE ROAD IN ARKANSAS VALLEY NORTH OF BUENA VISTA WITH BUFFALO PEAK IN DISTANCE. 4—THE ENTRANCE TO BEAR CREEK CANYON, 15 MILES OUT OF DENVER

the state. Although they require careful driving due to their winding nature which will not allow the driver to see very far ahead and also on account of their short, steep grades, they can all be made by an ordinary car. No tourist who thoroughly enjoys mountain scenery will care to go fast because the view is changing every second. Some of the most wonderful and picturesque views of snowcaps are to be had while driving on a narrow gorge road and the view will suddenly open up at a turn of the road at most surprising times; one truly wants four pairs of eyes.

Roads Generally Fine

Too much cannot be said about the road conditions in Colorado as compared with other sections open to motor travel. Although not boulevards like some of the newly constructed roads in the East, the number of miles that are affected by wet weather is remarkably small. Furthermore, the rainfall in Colorado is almost a minimum, particularly during the touring months. On only 2 days of our whole trip did we go over roads that would have been anywhere near impassable in wet weather, and both of these sections will be materially improved for the summer of 1913. Everyone of our party on completing the trip unequivocally stated that he would rather make the trip from either Denver, Colorado Springs or Pueblo for Grand Junction than travel over almost any other equal distance in the United States.

Early in the summer, the Denver Chamber of Commerce came to the writer for coöperation in getting a route laid out between Denver and Salt Lake City which should be a link in the transcontinental system published in the 1913 edition of the Blue Book. Immediately the similar organizations at Pueblo and Colorado Springs opened up correspondence to get the routes they were primarily interested in covered for the same reason. With this end in view the White company, of Cleveland, O., agreed to furnish a car to go over the two most important routes in Colorado and make the Utah connection between Grand Junction and Salt Lake.

We had been told something of the scenic attractions of such a trip, although it was not much more than we ourselves could imagine simply because we knew the route would cross the continental divide. In fact, one of the most striking features of the whole trip to us was the apparent lack of knowledge among Coloradoans themselves of what they actually had to offer the motorist. This applied not only to the magnificent scenery, but to actual road conditions as well. Almost every hour of the trip some wonderful bit of road or scenery was passed over that had never even been mentioned to us before leaving Denver. It may be that the Coloradoans who have really seen their own state have become so satiated with its wonders that they cannot appreciate it from the outsider's viewpoint. If such is the case, the sooner they wake up to the benefits of publicity the better it will be for the tourist travel which they desire.

Colorado Climate Helps

Another thing of vast importance to Colorado as a tourists' state is the climate. First, there is very little rain; this is particularly true between April and December. The number of clear, sunshiny days is almost the maximum. The atmosphere is wonderfully clear and, as nearly every one knows, the distances one can see are understood clearly only by those who have actually visited in the Rockies. Most of the nights in the hottest weather are cool and way into late October the days are warm enough, except in the very highest altitudes, to travel in a machine without an overcoat. This is no doubt due to the dryness of the air. This dryness in fact causes motorists the most serious trouble due to the excessive sun burn and chapping of lips so that

1—ROAD TO TOP OF KENOSHA PASS, OUR FIRST SNOW. 2—A VIEW FROM PARK OF THE RED ROCKS AT MORRISON. 3—ONE OF THE EXCELLENT VIEWS IN SOUTH PARK OF BUFFALO PEAK IN THE PARK RANGE. 4—IN PARK OF THE RED ROCKS—NOTE OBSERVATION TOWER ON ROCK AT RIGHT

people going out there in a machine who do not care to get burned up better carry some protection for the face.

Before starting on the trip, the White party determined in addition to taking the requisite route matter for the Blue Book, to provide the best means of procuring photographs which would intimately connect the scenic and touring conditions, so that the party on leaving Denver was made up of James A. Harris, Jr., advertising manager of the White Co.; W. A. Rheinick, also of the White Co.; Nathan Lazarnick, photographer, and the writer.

Ran on Slow Schedule

Tourists, in planning a trip similar to the one we went over, should bear in mind that their schedule for each day's run can be made up to cover considerable more mileage than we did and still allow sufficient time for taking in scenic attractions. We spent a great many hours taking pictures and for the most part did not average more than 90 to 100 miles a day. We also were unable to travel much after 5 o'clock, due to the light at that time being too poor for good photography.

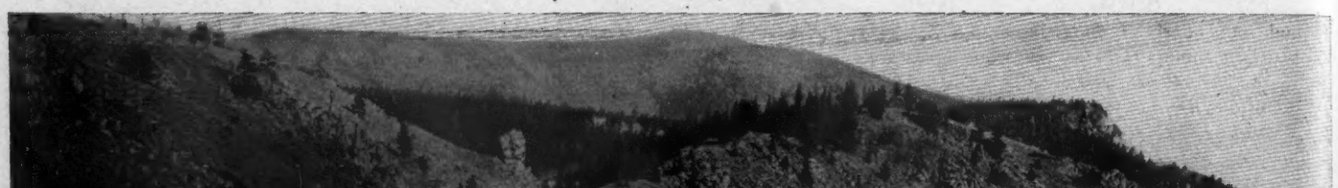
We left Denver on the morning of October 7th, heading southwesterly through Morrison, 15.2 miles from Denver. This short stretch is over the last of the plains with a very gradual rise about 600 feet to an altitude of 5,800 feet. At Morrison we stopped for quite a while to visit the Park of the Red Rocks. These rocks at some prehistoric time have been literally projected out of the earth to enormous heights with all sorts of peculiar formations. In addition to the natural amphitheater and the Lookout stand, which has been erected at the top of the highest rock, there is the Cave of the Titans and nearby is the cog road to the top of Mt. Morrison.

Almost immediately beyond the park entrance the route enters Bear Creek canyon. The first striking feature to us was that we had gone from the plains into typical mountain scenery, although the local people call them the foot-hills. The road is very close to Bear creek practically all the way, crossing it many times. Compared with many of the canyon rides we went over later it was a very easy and picturesque drive without any real thrillers; nevertheless we could not help but feel that there were thousands of people owning machines in Denver who had never visited this beautiful spot, within an hour's ride of the city. The upgrade is gradual with only one or two short, steep pitches of 12 to 14 per cent. For the most part the road is very winding, however, and, as on all mountain roads, no speed should be attempted even where the surface is excellent, due to the inability of those in the car to see very far ahead.

At about 20 miles out the canyon begins to open up into a valley with some small farms along the way, passing a store at Spruce Lodge, 24.2 miles. Just beyond this the valley narrows up again into a canyon for a short distance coming to Evergreen postoffice, 26.3 miles. The altitude here is almost 7,000 feet. Here we began to bear to the south, leaving Bear creek, and the rise becomes more noticeable with one winding upgrade of 17 per cent. At Conifer, 34.7 miles, the altitude is 8,150 feet. This, like many other small settlements, is not much more than three corners with a general store and postoffice, where a rough lunch can be procured if necessary. The road bears to the right and we continued to go upgrade for a few miles, reaching an altitude of about 8,600 feet, when the descent began into Baileys.

First View of Snow Caps

On this stretch between Conifer and Baileys there are two or three very long grades, some of them winding and a little rocky. Here is where we had our first real view of snow caps that were close enough to be shown in a photograph. As one will imagine, the view is always



THE CLIFF ROAD ALONG THE ARKANSAS RIVER COMING INTO GRANITE

ONE OF THE MANY MOUNTAIN VISTAS IN BEAR CREEK CANYON

changing, largely because the road has very few straight stretches, being of a winding nature up and downgrade all the time. The last hill into Baileys begins at about 46.5 miles and is almost constantly downgrade to the hotel, 49.2 miles from Denver. Here we saw our first railroad since leaving Morrison. The route follows this quite closely up the north fork of the South Platte river for about 15 miles. The altitude at Baileys is about 7,700 feet, and we again began a gradual climb up the river toward Kenosha pass. This whole section along the South Platte is dotted with small summer resorts, with many hotels which are open in July, August and September, and with excellent road conditions we found it to be a very picturesque ride. The grades are not long, although some of the turns are sharp.

Just after passing Grant we saw our first snow along the roadside; in fact, the road was quite wet from melting snow from here on. Between Grant and Webster Crossing the road was even narrower than anything we had previously gone over and quite rutty and rocky in a few places. This condition was probably more noticeable due to the fact that it was muddy from the snow and ice.

Over Kenosha Pass

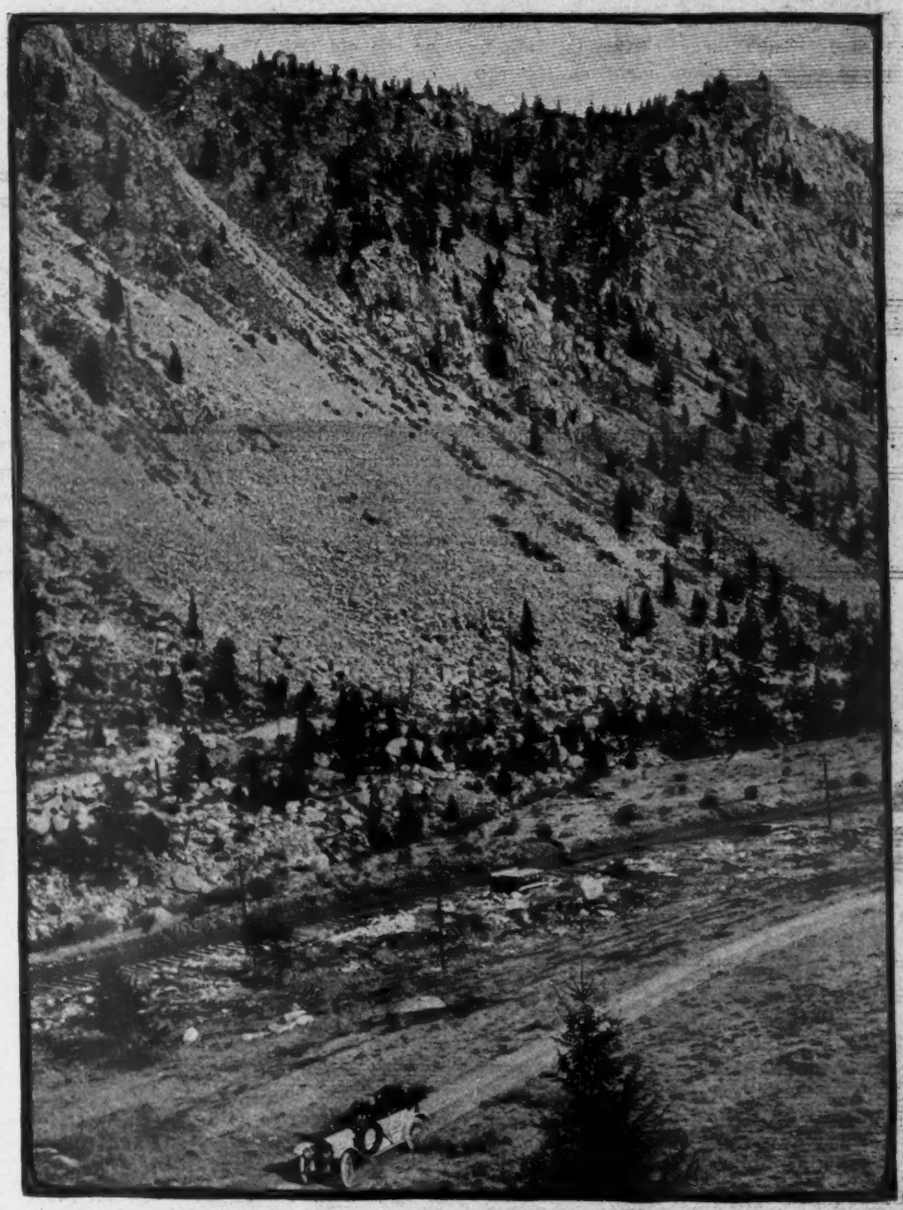
At 64.0 miles we crossed the railroad at Webster and almost immediately began the climb up Kenosha pass. We found that a great deal of improvement had been done on this road, not only on the old grade, but in some instances, an entirely new grade had been made, reducing the steepness considerably. The top of the pass is reached at 68.6 miles, a rise of 1,000 feet in 4 miles. When we reached here it was almost dark and we missed the wonderful views overlooking South park coming down off the pass. We also missed the daylight, as we found that the 2-mile stretch from the foot of the pass across the head of South park was regular Illi-

nois mud and nearly 1 foot deep. This was the only muddy stretch we had on the whole trip and was probably about at its worst due to the alternate freezing and melting each day. However, we found that the road down the west side of the park was hard and dry, most of it surfaced with either gravel or decomposed granite.

A Park 50 Miles Long

We came into Jefferson, 73 miles from Denver, at just 6 o'clock, and found that we could get accommodations at Head's ranch, where we put up for the night. This stop here gave us a little opportunity to find out something about South park, as we were anxious to learn what sort of a park it was, but found on inquiry that it is customary in Colorado to call these high fertile plains or plateaus, surrounded by mountains, a park. In other sections of the state there are what is known as North park, Middle park, etc. South park extends in an almost unbroken plain from just north of Jefferson clear to Hartsel, a distance of over 50 miles, and the average width is probably 10 to 15 miles. The mountains on almost every side rise up quite sharply from the plain. The Park range on the right, although not actually part of the continental divide, is what might be called sort of an extension and is almost as high, with Buffalo peak—altitude 13,330 feet—standing out prominently in the range to the southwest. The altitude in most parts of the park ranges around 9,100 to 9,800 feet, and in October the temperature gets down during the nights to 20 and 25 degrees.

On the morning of the second day, October 8th, we were able to get an early start at 7 o'clock, although we did not hurry as we were anxious for the light to procure some good pictures of the snow caps to the west of us. Although not so startling as many other things on the trip, this ride along the Park range was very impressive and one we will all remember.



JUST NORTH OF BUENA VISTA ON THE ROAD TO LEADVILLE

LOOKING NORTH ON CLIFF ROAD ABOVE THE ARKANSAS

At 80 miles from Denver we passed through Como, once a thriving mining town with a division point on the railroad, but is now what is known as a busted town. At about 85 miles we went up quite a long winding grade, although not very steep, crossing a slight ridge. Coming down over the south side of this ridge we had our first ride on a convict road, the new road having just been completed during the summer of 1912.

Prairie Dogs Require Caution

At 90.2 miles we reached Fairplay, the largest town in South park and the county seat of Park county. There is a good small garage here, also hotel accommodations. At 101.3 miles the road branches, the left going direct to Hartsel for Colorado Springs, while the road keeping to the right along the foot of the range is for Buena Vista and the one we followed. At 107.4 miles we crossed the railroad at Platte River ranch with the Antero reservoir to the left. The road here in the south end of the park is very much like the plains road, practically no improvements having been made and vegetation scarce. The surface is good, however, although caution should be used for prairie dog holes.

At 110 miles we passed what is known as the old Salt Works, and just beyond commenced a gradual rise out of the park to the top of Trout Creek pass, 114.0 miles. The road has been very much improved and we were at the top of the pass almost before we realized it, an altitude of about 9,500 feet. The ride down off the pass, particularly after passing Newett, 117.7 miles, brought forth one continual round of exclamations from everyone in the party. The road, although very winding, with sharp turns on 10 to 12 per cent grades in spots, is almost like a boulevard. If time had permitted we should like to have visited the Castle Rocks, which are passed just below Newett. Although there are a number of similar formations in the state these are about as striking as any we saw. The ride is down Trout Creek canyon, the grade being located on the north side. Just after coming along Castle Rocks we had our first real view of the continental divide across the Arkansas valley, with Mt. Princeton almost straight ahead. This peak, with Mt. Yale and Mt. Harvard to the north, are sometimes called the Collegiate range, although they are really part of the Saguache range. This range is parallel to the Park range and on the west side of the Arkansas river. It is the central part of the continental divide and has the highest peaks of the Rockies, the Collegiate group all being over 14,000 feet high.

The descent from Trout creek is over 7 miles long, the real foot of the pass being reached at 127.5 miles. The road to the left here is almost straight south down the Arkansas 23 miles to Salida. We turned north up the river directly into Buena Vista, 130 miles from Denver, altitude 7,960 feet. This is about what the ordinary tourist, following the route we did, will cover in a day's ride, therefore we changed our mileage at this point back to zero and after luncheon started out for Leadville.

Watch Snowstorm in Shirt Sleeves

The weather was ideal in every way, being so warm that if we had not been driving in the car we could have gone around very comfortably without our coats and at the same time we had our first experience of watching a snowstorm on the peaks above us. In a few places the storm was so close that snowflakes actually reached us. The road north up the Arkansas was a gradual ascent all the way on good road. It is practically a gorge road

Little Chance of a French Grand Prix Road Race in 1913

Only Sixteen Nominations Received When Entries Close, Minimum of Forty Being Required—Now Europe is Interested in L'Auto's Proposed 183-Inch Contest

PARIS, Nov. 1—At the moment the entry lists for the French grand prix were closed with a total of sixteen out of the minimum of forty cars required—thus probably entailing the abandonment of the race—the rules were made public for the Coupe de l'Auto, or 3-liter race to be managed by L'Auto. In all probability this will be the only race of the year, for L'Auto is opposed to allowing the big cars to join in with the 3-liters as was done at Dieppe this year, and the national club cannot hold its race independently with only sixteen cars.

There is a possibility that the club having failed to get the required number of entries for its own event, may ask to be allowed to join L'Auto in the organization of the 3-liter event, thus giving an official character if not adding to the importance of this race.

It is now certain that the 3-liter race to be held on Sunday, June 29, over a course yet to be selected, will be the most important European speed contest of the 1913 season. Races have been run under these rules in 1911 and 1912, and next season will see their last application, the organizers being of the opinion that full advantage will have been got out of them after 3 successive years' experience.

Though the same in principle, there are a number of important detail changes in the regulations. Feeding the cylinders by any mixture at more than atmospheric pressure is forbidden. Last year Hispano-Suiza built a set of cars with a couple of additional cylinders acting as compressors of the explosive charge. These cars were not entered for the race, but it was feared that similar attempts might be made to pump a charge into the cylinders and thus falsify the results of the race.

The new rule says that at the moment of introduction to the cylinders the mixture must not be at higher than atmospheric pressure at 760 mm. of mercury.

It is no longer necessary that the driver and mechanic should sit side by side. The latter may be behind the former, and probably will be in most cases, with a substantial decrease of head resistance. It is argued that stream line forms are to the final benefit of the car owner and should be encouraged and not discouraged in all races. A return has been made to the conditions prevailing prior to 1906 by allowing work to be done on the cars by attendants and authorizing the establishment of depots at any point around the course. It is the experience of the late David Bruce-Brown and the Peugeot driver Goux, both disqualified for taking gasoline on the course at Dieppe that has led the organizers to make this change. So far as tires are concerned the difference will not be enormous, for with the general use of detachable wheels big tire-changing staffs are not required.

Instead of a minimum chassis weight of 1,763 pounds, a maximum of 1,984 pounds has been imposed. It is believed that in the last two races manufacturers did not sufficiently study the problem of weight reduction, for while there were a few cars which held to the road perfectly although remaining very close to the minimum mark of 1,763 pounds, many of them were built up to nearly 2,000 pounds under the belief that lower-weight cars would not stick to the road. The weight is taken without water, gasoline, oil, spares, tools, etc. The two men must scale 308 pounds, any deficit being made up by ballast. Entries for the race close on December 31, and at double fees on March 31. For a single car the ordinary fee is $200; for two cars, $360; for three cars, $500, and for a full team of four cars, $600. The place of the race has not yet been decided.

The sixteen cars which sent in their engagement for the grand prix of the Automobile Club of France represent the firms Sunbeam, Peugeot, Delage, Mathis, Itala with valveless type, Opel, and Schneider. The sporting committee of the A. C. F. will meet in a few days to decide what shall be done. There appear to be but two courses: either abandon the race altogether or allow entries to be received at ordinary fees until January 1. Probably the former course will be preferred, for the manufacturers object to being kept in doubt as to the holding of the race until

part of the way, with steep cliffs on either side. After getting about 12 miles out the road becomes very winding with sharp turns on upgrades. At about this point we were met by an escort of three cars from Leadville which went ahead to pilot us. At 16 miles we crossed the Arkansas and immediately came onto a cliff road literally cut out of the rock about 600 feet almost straight above the river. It was our first experience on what we later came to call eyelash roads. The experience of riding along such roads can hardly be described. As a thriller it is best illustrated when one realizes that whoever is in the outside of the tonneau seat gets the impression that he is riding along on nothing, as about all he can see on looking over the side of the car is space. The surface was excellent with frequent turnouts, but turns are sharp and numerous. However, there is less than 2 miles of this, and we reached Granite at 17.7 miles.

Along Shore of Twin Lakes

From here to Leadville there are two roads—the shorter known as the river road—but although it is just as good, we decided to follow the longer route via Twin Lakes in order to take in this scenic spot. The first view of the lakes was to be had about 4 miles from Granite and the road follows along close to the shore all the way past the hotel to the head of the upper lake. It is almost impossible to adequately describe the beautiful location of these lakes. They are literally at the foot of the continental divide, with Mt. Elbert on the north and Twin Peaks on the south rising almost straight up from the shores of the lake. The former peak has an altitude of 14,421 feet, only 3 feet less than Mt. Massive, the highest peak in the Rockies, which is located just to the north of Mt. Elbert. Although the view from the shore of the lakes is wonderful, a complete realization of this beautiful spot was much more fully appreciated when we had reached the top of the hill above the lakes.

All the way up the winding grade the view out over the valley opened up more and more, but on reaching the top of the climb we had the most impressive view. Leaving the car and stepping over to the edge of the bluff we got our first full view of both lakes 500 feet below, with the majestic snow caps towering above. Although practically nothing has been written about this spot, it is worthy to be ranked with the best in the state.

Coming down off the hill the road swings to the east along the Arkansas and straight north to Malta Junction, 38.4 miles, where we turned right, passing the enormous smelter of the American Smelting Co., and reaching the hotel in Leadville by 6 p. m.

Typical Mining Town

Leadville, 42 miles from Buena Vista, has an altitude of 10,185 feet. This is a typical mining town and probably one of the best known the world over, as it has produced in lead, zinc, copper, gold and silver 400 million dollars. Tourists will do well to stop at least half a day here to visit some of the smelters, properly seeing mining operations. It is also the natural point to start out on the ascent of Mt. Massive, which can be made in 1 day.

We were well taken care of by the Leadville people and our one regret was lack of time to accept their invitation to stay over and see the actual mining and smelting operations. In the evening a sort of impromptu good roads meeting was held with a few of the prominent business men, and we found them, like the majority of people all along our route, alive to the importance of good roads and actually doing things in the construction of improved highways.

(To be continued)

Western Farmers Put Stamp of Approval on Motor Cars

North Dakota Better Farming Association Decides to Equip Field Men with Power Machines for Purpose of Carrying Its Representatives on an Educational Campaign

FARGO, N. D., Nov. 11—Motor cars hereafter will be used exclusively by the North Dakota Better Farming Association to carry education in scientific farming methods direct to the farmer on his land. An exaustive test extending over 2 years has just been completed by Secretary Thomas Cooper who announces the adoption of the motor car by the association.

As a result the field men of the association stationed in nearly every county of the state will be provided with motor cars and will use them in visiting the farmers at home and carrying to them the latest discoveries in agricultural science. The North Dakota Better Farming Association under the direction of Secretary Cooper is the first organization to adopt the plan of carrying agricultural education to the farmer at work in his fields and the motor car has been selected as the best medium for the transmission of the scientific knowledge.

For 2 years the association has carried on experimentation to determine the relative cost of horses, motor cycles and motor cars with the result that the car proved itself capable of doing more work at a smaller comparative cost of upkeep than either of the other means of transportation.

The field agents of the association stationed in more than twenty counties of North Dakota work in co-operation with the men on the farms to secure better agricultural results in the state. Their work calls for a vast amount of traveling as they are called upon to cover their entire territory weekly.

During the last season one car traveled a total of 5,280 miles at an upkeep cost of $1.75. With depreciation added the cost per mile was slightly less than 4.5 cents. In several other counties records nearly as good were made. In two counties motor cycles showed a smaller cost per mile but the user was unable to cover the same amount of territory that could be covered by motor car. Motor cycles probably will be used for another year in one or two of the newer counties.

In the counties where horses were used for covering the territory it was found that the distance covered was smaller while the cost of upkeep was in some cases double the cost of motor car upkeep.

ENGLISH TO HAVE ROAD RACE

London, Nov. 2—It is authoritatively stated that the Royal Automobile Club is planning to run a road race on the Isle of Man next year. Details have not yet been announced, but it is anticipated that no difficulty will be experienced in getting permission to use the roads for racing purposes.

such a late date as January. The charge is made in certain quarters that the club is not at all enthusiastic over its own race, or it would have announced the event as certain whatever the number of cars received and fixed the closing of the lists after the European motor shows. From private sources it is learned that the French firms Peugeot, Delage and Schneider, as well as the English Sunbeam, will transfer their grand prix entry to the 3-liter or 183 cubic inches race.

EXPORTS AND IMPORTS

Washington, D. C., Nov. 12—Government statistics made public today show that 1,590 motor cars valued at $1,438,528 were exported in September, as against 1,159 cars valued at $1,121,544 during the same month of 1911.

The exports for the 9 months ending September, 1912, amounted to 18,406 cars, valued at $18,252,299, as against 11,244 cars, valued at $11,565,034, during the same period of 1911.

The exports by countries were: France, $45,538; Germany, $26,022; Italy, $23,519; United Kingdom, $104,080; other Europe, $73,620; Canada, $473,465; Mexico, $71,564; West Indies and Bermuda, $19,750; South America, $153,919; British Oceania, $194,471; Asia and other Oceania, $155,676; other countries, $96,904.

Eighty-three motor cars were imported in September, 1912, valued at $165,646, as against sixty-two cars, valued at $137,253, imported during September a year ago.

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Colorado and Its Wonders

MOTOR AGE begins in this week's issue the first of a series of articles descriptive and illustrative of a 1,000-mile tour through Colorado in the heart of the mountain section, a tour made with the object of photographing the scenic attractions of the Rocky mountains in the state, and also to discover the suitability of the roads for motor touring.

THE photographic reproductions speak for themselves; and so far as the roads are concerned it can be said to the credit of Colorado that only one stream had to be forded in this entire distance, and that only once was a tow necessary, and that for a short distance.

THE tour has demonstrated that Colorado is the Eden of America so far as possible touring of to-day is concerned. The roads instead of being unknown trails, as many had imagined they were, are better on the 1,000 miles covered in this trip than the touring roads of the Adirondack mountains. This should be pleasant news to the tourist, who never has witnessed the marvels of the mountains which form the backbone of the continent, solely because he has imagined it was impossible to see them from the motor car. He has imagined that traveling through a pass at an altitude of over 10,000 feet was an impossibility, but it is not. If cars can traverse such passes without the slightest difficulty in the middle of October, there is no reason why such a trip in the earlier months would not be as pleasant and easily made as a tour through the Berkshires at the same period.

THE mountainous grades which so many have heard vaguely about are largely hallucinations, and in the course of a few years, when the present extensive road system has been more completed, it will be possible to cross the mountains in the majority of the Colorado passes without encountering a grade exceeding 15 per cent. It is true that at present the roads are narrow in places, but there are the necessary turn-outs so that passing vehicles traveling in the opposite direction or overtaking slower moving vehicles traveling in the same direction is not so difficult as imagined. With the roads of Colorado to-day it does not call for a professional chauffeur or an expert mechanician; rather the amateur, who is competent to drive his car on the country roads of the east, center or west is adequately qualified to take his machine with his friends or family on a 1,000-mile jaunt through the most majestic scenery of the Rocky mountains and Colorado.

FOR the eastern tourist there is but one obstacle at the present time, namely, the apparently excessive freight charges between Chicago and Denver, which are several times that for an equal distance east of the Illinois metropolis. Many who want to spend 2 weeks in this playground of America do not care to tour there and back, and it is imperative that the motorist and business interests of the Rocky mountain states get together and procure the lowest possible freight rates from Chicago to Denver. Such action will help touring in those sections; it will be but one of the logical steps in bringing this grand heritage of America within the reach of tens of thousands of the population.

The Stone Road Project

FOR reasons unknown to the public at the present time the motor car manufacturers have not taken up with expected avidity the project of securing a stone highway from the Atlantic to the Pacific by the summer of 1915 and purchasing the materials for such a highway by a fund raised among the motor car and accessory manufacturers. The Indiana makers set the ball rolling with unbounded enthusiasm, and one of the tire companies came forward voluntarily with a liberal offering, the total aggregating more than a million, all being accomplished in a few weeks time, and it seemed that the necessary fund to purchase the material would be ready by January, 1913. With the raising of the first million a cessation came. No public explanation has been made as to why, but it has generally been attributed to a difference of opinion amongst makers in manufacturing centers. Undoubtedly some have been for other means of road-building, federal aid, or other measures.

IT is to be regretted that the movement is apparently in a slump because with the rank and file of the American citizenship the demands for such an improved highway are greater to-day than they were 6 weeks ago. It is only dawning upon the American citizen the losses he is suffering annually because of unimproved roads. Not one motorist in 10,000 sits down and sanely estimates the increased cost of running his car 5,000 miles per season because of the poor highways. He fails to take into consideration the wear and tear on his machine because of the road surface; he fails to calculate the excessive tire wear due to the sharp boulder in the road surface which he strikes in an unguarded moment, and probably inflicts a bruise on a tire, resulting in a premature blow-out; and he fails to calculate the additional outlay in gasoline.

BUT the expenditures enumerated are only those applying to the machine: There is the humanitarian side. While there is wear and tear on the car there is worse wear and tear on the passengers. When a portion of a car breaks or is damaged there is a stated repair bill, but not so when personal injury results. Not a motorist but realizes the injury of driving all day in a dust-laden atmosphere, with germs everywhere. Contrast this with a smooth, well-oiled road surface in which the motorist enjoys the healthful air as it was deemed he should. These are the great reasons why America needs road improvement.

THE strong argument of a stone highway from ocean to ocean is that it makes it possible for the motorist of the present generation to see his own land. True, the many transcontinental railroad lines which have done noble pioneering work in this respect and offer reasonable facilities for sight seeing, but the possibilities of knowing the land and meeting the people are not to be compared with those afforded by the motor car.

More Than a Million in Fisher Fund

Many Concerns Contribute to Big Highway Scheme

INDIANAPOLIS, Ind., Nov. 11—Carl G. Fisher and J. A. Allison, at the head of the movement to raise a fund of $10,000 for material for a road from coast to coast, announce that in 30 days more than $1,000,000 has been contributed, of which amount Indianapolis has promised $310,000. The movement is spreading rapidly and help is promised from many sources. The following companies and individuals have pledged their 1 per cent contributions, payable either one-third of 1 per cent for 3 years, or 1 per cent for 1 year of their total gross sales:

CAR MANUFACTURERS

Prest-O-Lite Co., Prest-O-Lite gas tanks, Indianapolis.....$60,000
Wheeler & Schebler Co., Schebler carbureters, Indianapolis..... 50,000
Ideal Motor Car Co., Stutz cars, Indianapolis.....⅓ of 1% for 3 years
Premier Motor Mfg. Co., Premier cars, Indianapolis..⅓ of 1% for 3 years
Waverley Co., Waverley electrics, Indianapolis.....⅓ of 1% for 3 years
American Motors Co., American cars, Indianapolis..⅓ of 1% for 3 years
Henderson Motor Car Co., Henderson cars, Indianap's.⅓ of 1% for 3 years
Motor Car Mfg. Co., Pathfinder cars, Indianapolis...⅓ of 1% for 3 years
Pumpelly Battery Co., electric batteries, Indianapolis.⅓ of 1% for 3 years
Christian Off & Co., fenders and specialties, Ind'nap's.⅓ of 1% for 3 years
Gates Mfg. Co., tops, etc., Indianapolis.....⅓ of 1% for 3 years
R. J. Irwin Mfg. Co., tops, bodies, etc., Indianapolis.⅓ of 1% for 3 years
Glover Equipment Co., tops, etc., Indianapolis.....⅓ of 1% for 3 years
Goodyear Tire & Rubber Co., Akron, Ohio.....$300,000

INDIANAPOLIS DEALERS.

Gibson Automobile Co., Overland state agents.....⅓ of 1% for 3 years
Empire Tire Co.....⅓ of 1% for 3 years
Gus Habich Co, motor cycles.....⅓ of 1% for 3 years
G. H. Westing, motor cycles.....⅓ of 1% for 3 years
Cadillac Auto Co. of Indiana, Cadillac state agent..⅓ of 1% for 3 years
Archey Atkins Co., Pierce and Hudson state agent..⅓ of 1% for 3 years
Oakland Motor Co., Indianapolis branch.....⅓ of 1% for 3 years
Morton Place Automobile Co.....⅓ of 1% for 3 years
Mutual Printing and Lithographing Co.....⅓ of 1% for 3 years

CLUB

Hoosier Motor Club, Indianapolis, 400 club buttons at $5.....$2,000

OUTSIDE OF INDIANAPOLIS

Brown Commercial Car Co., Peru, Ind.....⅓ of 1% for 3 years
Remy Electric Co., Anderson, Ind.....$50,000
Esterline Mfg. Co., Lafayette, Ind.....⅓ of 1% for 3 years
Fellwock Auto and Mfg. Co., Evansville, Ind.....⅓ of 1% for 3 years
Moore Motor Truck Co., Waterville, O.....⅓ of 1% for 3 years
American F. U. Co., Newtonville, Mass.....⅓ of 1% for 3 years
Doehler Die Casting Co., Brooklyn, N. Y.....$5,000
Federal Pressed Steel Co., Milwaukee, Wis.....$2,000
Dorris Motor Car Co., St. Louis, Mo.....⅓ of 1% for 3 years
Edwards Motor Car Co., New York.....⅓ of 1% for 3 years
Dispatch Motor Car Co., Minneapolis, Minn.....⅓ of 1% for 3 years
Lunkenheimer Co., Cincinnati, O.....$1,500
Wheeling Corrugating Co., Wheeling, W. Va.....$100

Thomas A. Phillips Motor Car Co., Dayton, O.....⅓ of 1% for 3 years
St. Joseph Auto and Supply Co., St. Joseph, Mo.....⅓ of 1% for 3 years
Tom Botterill, Denver, Colo.....⅓ of 1% for 3 years
Nelson & LeMoon, Chicago.....⅓ of 1% for 3 years
Enterprise Garage Co., Columbus, O.....⅓ of 1% for 3 years
Pound & Miller, South Chicago.....⅓ of 1% for 3 years
Central Motor Car Co., Canton, O.....⅓ of 1% for 3 years
R. W. Tansill, Chicago.....⅓ of 1% for 3 years
George M. Miller, Boston, Mass.....⅓ of 1% for 3 years
W. N. Pungs, Detroit, Mich.....⅓ of 1% for 3 years
Phoenix Motor Car Co., Lexington, Ky.....⅓ of 1% for 3 years
Overland Co., Grand Rapids, Mich.....⅓ of 1% for 3 years
H. C. Whitaker, Wheeling, W. Va.....⅓ of 1% for 3 years
A. H. Wells Co., Waterbury, Conn.....⅓ of 1% for 3 years
Newstadt Automobile Supply Co., St. Louis, Mo.....⅓ of 1% for 3 years
Henry White, Stapleton, N. Y.....⅓ of 1% for 3 years
W. A. Shanahan Co., New York.....⅓ of 1% for 3 years
American Auto Supply Co., New York.....⅓ of 1% for 3 years
Lehardy & Lindsay, Rochester, N. Y.....⅓ of 1% for 3 years
Michael Murphy, Cambridge, Mass.....⅓ of 1% for 3 years
Leonard's garage, Auburn, N. Y.....⅓ of 1% for 3 years
James N. Boyce, New Haven, Conn.....⅓ of 1% for 3 years
Walter Scott, Baltimore, Md.....⅓ of 1% for 3 years
Budd M. Robinson, Joplin, Mo.....⅓ of 1% for 3 years
Drysdale garage, Decatur, Ill.....⅓ of 1% for 3 years
Forbes Motor Car Co., Pittsburgh, Pa.....⅓ of 1% for 3 years
Sixth Street Garage, Los Angeles, Cal.....⅓ of 1% for 3 years
B. W. Twyman, Columbus, O.....⅓ of 1% for 3 years
M. Kirchberger & Co., New York.....⅓ of 1% for 3 years
Avery Stamping Co., Cleveland, O.....⅓ of 1% for 3 years
American Brass and Iron Co., Detroit, Mich.....⅓ of 1% for 3 years
Hamilton Square garage, San Francisco.....⅓ of 1% for 3 years
Winton Motor Sales Co., San Diego, Cal.....⅓ of 1% for 3 years
F. P. Choate, agent Kissell Motor Co., Chicago.....⅓ of 1% for 3 years
Southern Garage, Pittsburgh, Pa.....⅓ of 1% for 3 years
Halcken Elberg Mfg. Co., Kansas City, Mo.....⅓ of 1% for 3 years
J. D. Sourwine, Brazil, Ind.....⅓ of 1% for 3 years
Southern Motor Car Co., Jacksonville, Fla.....⅓ of 1% for 3 years
W. W. Carpenter, New Franklin, Mo.....⅓ of 1% for 3 years
Pressed Steel Tank Co., Milwaukee.....⅓ of 1% for 3 years
Smith-Everett Auto Co., Portland, Ore.....⅓ of 1% for 3 years
John B. Quinn, Fall River, Mass.....⅓ of 1% for 3 years
E. C. Burke, Seattle, Wash.....⅓ of 1% for 3 years
Bert Farrar, Seattle, Wash.....⅓ of 1% for 3 years

Coming Motor Events

November 23-24—Track meet, Fresno, Cal.
November 28-29—Track meet, Richmond Automobile Club, Richmond, Va.
December 2-3—Annual meeting American Automobile Association, Chicago.

SHOWS

November 8-16—Olympic.
November 13-15—N. A. A. M. meeting, Detroit.
November 16-23—Atlanta, Ga.
November 26-30—Show at Grand Rapids, Mich.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Montreal, Canada.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
February 1-8—Chicago.
February 10-15—Chicago truck show.
February 10-15—Minneapolis.
February 11-15—Ottawa, N. Y.
February 15-22—Newark, N. J.
February 16-23—Richmond, Va.
February 17-22—Kansas City.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
March 3-8—Pittsburgh.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo.
March 19-26—Boston truck show.
March 24-29—Indianapolis.

The Chauffeur's Calling

WHAT is perhaps the best estimate of the motor car operator's calling is found on the wall at one of the Boston motor schools, and it is well worth being read by all chauffeurs. It is as follows:

"The chauffeur sustains a peculiar relation to his employer. He is not a servant on the one hand, nor a companion on the other. He is supposed to be a skillful, well-trained, competent, gentlemanly, respectful employee, who not only knows his business, but his place, and where he fits into the transportation problem. All of these points, mechanical, social and economic, are presented in the well conducted motor car school and as a result the chauffeur knows his profession and is alert to the responsibilities and requirements and is prepared to meet them. He sustains the same relationship to the motor industry that the marine engineering department of the United States navy does to our entire naval establishment.

"These engineers are graduates of the Naval Academy at Annapolis and are cultured, refined gentlemen; yet they put on overalls and stand watch in a hot engine room below decks, surrounded by engines of all descriptions, with a complete knowledge of every nut, bolt and shaft of the entire vessel. These men do not apologize for their grimy hands, but, instead of being classed as ordinary mechanics, they have raised the whole standard of marine engineering to the gentleman's level, and have shown that the skilled operator of expensive and delicate machinery is quite on a par with his cleaner, though no more honorable, fellow officer of the quarter deck.

"The chauffeur should thus regard his profession and seek to be an indispensable adjunct to every refined American home which can afford the luxury of a motor car; or if in commercial lines he should strive to make himself a thorough master of the requirements and economic conditions of the industry, and be an important factor in it."

Flanders–United Motors Deal Certain

Decision of Judge Hough in New York Denying Petition for Intervention in Reorganization Plans Followed by Confirmation of Merger Rumors—Going to Detroit

DETROIT, Mich., Nov. 12—Confirmation of the reported merger of the Flanders Motor Co., of this city, and the United States Motor Co. was given out last night following the decision of Judge Hough of the United States district court in New York, in which he denied the petition of some of the stockholders of the United States Motor Co. for intervention in its reorganization plans.

Walter E. Flanders will head the enlarged corporation, and the headquarters of all the plants except that of the Stoddard-Dayton at Dayton, O., will be moved to this city, it is declared.

The plans as now formulated contemplate the purchase of the Flanders Motor Co. for $3,750,000, of which $1,000,000 will be paid in cash and the remainder in stock. It is stated that while W. E. Metzger and B. F. Everitt withdraw from active participation under the new basis, they still retain stock interests.

The bringing of the executive offices of the various United States Motors, subsidiaries to Detroit means much to the city. The Sampson and Brush plants probably will be reopened, giving employment to some 500 additional workmen, while it will also mean the location of various manufacturers of parts here, so that in the end some 10,000 new workers will be added to the already great army of industrial operators now engaged in the many motor lines in this city.

Officers of the Flanders organization could not be reached today, so it is impossible to get at details of the transaction other than those given above.

United Motors Auction Ordered

New York, Nov. 11—What in effect is an auction sale has been ordered by Judge Charles M. Hough with regard to the assets of the United States Motor Co. Of course, there will be no "Going, Going—Gone" feature such as mark regular auction sales, but in the essential particulars the disposition of the property will be by an auction sale.

Next Monday the court has signified its intention to sign a final decree of sale, and while the time for its consummation has not yet been fixed, it is certain it will take place some time in January.

Under the form of order prepared today in the United States district court the bidders will have the opportunity to bid on the assets divided into six parcels, or on the whole as a single lot. A certain qualifying amount of cash or certified check will be required from each bidder and the deposits together with the formal bids may be placed in the custody of the court between the hours of 11 o'clock in the morning and 3 o'clock in the afternoon of the day fixed for the sale.

The auction feature arises from the fact that bidders will be allowed, under the tentative form of the final order, to increase their offerings at any time prior to the hour set for the closing of the sale. The division of the assets will be along these lines:

Parcel No. 1 shall consist of all the property of the United States Motor Co. Parcel No. 2, all the property of the Alden-Sampson Mfg. Co.; No. 3, Brush Runabout Co.; No. 4, Columbia Motor Car Co.; No. 5, Dayton Motor Car Co., and No. 6, Maxwell-Briscoe Motor Co. The parcels will be offered in the order of their numbering. Immediately after the bids have been concluded for the various parcels the whole property will be offered as an entirety.

There was little comfort in the proceedings for the elements that have made objection to the immediate settlement of the company's affairs. They were on hand in court, but the rulings from the bench were against them. The three-headed demurrer which was informally filed on behalf of certain stockholders was dismissed. The demurrer alleged that the court had no jurisdiction; that insufficient facts were set out in the bill of complaint and took up other technical grounds. Judge Hough held adversely to the demurrer on the ground that the court did have jurisdiction; that sufficient facts were stated in the bill and that the affirmative action of the officers of the various defendant concerns bound the stockholders in the absence of allegations of fraud.

It was stated by one of the objecting attorneys that the court ought to name a referee to investigate the alleged shrinkage of assets between the time of the last annual report, when it was shown that they footed up to over $23,000,000, while at the time the receivers completed their work there was a nominal loss of over $12,000,000.

It was explained that the apparent shrinkage was due to the elimination of all items not directly representing some tangible assets from the report of the receivers, and further that the last annual report of the company represented the assets in the light of the seller, while that of the receiver looked at the case from the buyer's point of view.

Mr. Curtis, representing a large amount of preferred stock, said that the creditors who were represented to the extent of $10,000,000 of claims by Joline, Larkin & Rathbone were the only parties in position to bid on the assets when it came time for the legal sale. This, he explained, was due to the fact that they could put in their claims with the bids submitted, while all others would have to bid actual cash. Thus the situation resolved itself into a contest between paper and cash, with all the advantage on the side of the paper.

A suggestion was made by James N. Rosenberg that an offer had been submitted to lease the Brush and Sampson plants in Detroit during the receivership. He said that if such a lease could be consummated it might help the whole property at the sale.

At the session it was not stated who the prospective tenant might be, but after adjournment it was announced that it might be the Flanders Motor Car Co., although the definite statement was not made. It was stated that the Flanders company required extensive manufacturing facilities and that as both the Brush and Sampson plants were practically closed down, the deal would be an excellent one from every point of view. The court gave assent to leasing the plants, but limited the term to the receivership.

Mr. Rathbone, of Joline, Larkin & Rathbone, said that the merger between the United States Motor Co. and the Flanders Motor Car Co. had been tentatively arranged on the best possible terms and that Walter Flanders would be the next president of the United States Motor Co. in all probability. He said that it would be impossible to make a more definite statement pending the action of the court. The proposed contract must be ratified by both sides, but it is said that it has been prepared in final form. Mr. Rathbone said that the Flanders company would be taken over free from all but its current indebtednesses, dealers' deposits and current accounts.

Fully 91 per cent of the claims against the United States Motor Co. have been deposited under the plan of reorganization and a considerable fraction of the remainder, consisting of about $1,000,000, would be deposited within a week.

The stock deposits are coming in at a slower rate. About $4,000,000 par value of both issues have been turned in, but the amount so deposited is of relatively small importance to the re-establishment of the company.

Farewell Banquet for Briscoe

Benjamin Briscoe, retiring president of the United States Motor Co., was the guest of honor at a banquet given by officers and employees of the United States Motor Co. in the Hotel Astor last Thursday night. The well wishes of the employes was manifested by the gift of a Tiffany watch and fob from the men and a large bank of chrysanthemums from the young women of the company.

Tire Tread Patent Decision Reversed

United States Circuit Court of Appeals Decides Against Hartford Rubber Works in Case Involving Midgely and Adams Claims—Injunction Decreed Against the Defendant

NEW YORK, Nov. 11—Overturning the judgment of the United States district court, district of Connecticut, the United States circuit court of appeals has reversed the findings of Judge Platt in the suit of the Metallic Rubber Tire Co. against the Hartford Rubber Works, involving the Adams and Midgely treads. In the lower court Judge Platt dismissed the bill and found in favor of the Hartford company. The upper court sustains the Adams patent, decrees an injunction against the Hartford company and orders an accounting as between the parties and gives a decree for costs against the defendant.

The suit was instituted by the Metallic Rubber Tire Co., alleging that the Hartford company infringed its patent rights under the Adams patent. The Hartford company responded by setting up defenses of invalidity, non-infringement, abandonment and want of equity and Judge Platt found for the defense, dismissing the bill in the first instance.

Appeal was taken by the complainant to the circuit court of appeals and the full bench, consisting of Judges Lacomber, Coxe and Noyes, heard the arguments, which were presented by Alfred Wilkinson for the complainant and E. W. Vaill for the defense. Judge Noyes wrote the opinion, the more pertinent parts of which are as follows:

Concededly the nearest approach to the patent in question is the Phillips English patent, and the question of anticipation may well be determined by examining that patent and comparing it with the one in suit.

The principal object of the Phillips patent was to protect and strengthen pneumatic tires. It illustrates numerous ways for stiffening and protecting tires, and among others, points out that the tread or wearing portion may be reinforced or strengthened by stitching the rubber with metal wire, threads, cord and the like. Some of the drawings of the patent are very similar to those of the patent in suit. The prevention of slipping, however, is not stated to be either an object of the Phillips patent nor a result of the use of its structure. Moreover, it is not clear that the non-skidding effect would be obtained by following the teachings and drawings of the Phillips patent.

Wire sewed into a tire to reinforce the rubber naturally would be flexible wire, while only stiff wire would furnish the hard bearings required to prevent slipping, especially after the wearing off of the loops. The Phillips patent shows that rubber tires may be stiffened and protected by wire stitching but, in our opinion, does not teach that exposed wire stitchings will make hard bearings to prevent skidding. Indeed, many things in the Phillips patent point in the direction of covering the wires and it is never essential that the stitches should be flush with the surface of the tread.

The court then dismisses the objection raised as to the validity of the Adams patent by commenting on the fact that the Hartford company has had a license to manufacture under a patent and upon the expiration of the license has put out a product which, even if not infringing, closely simulates the patented structure. In conclusion Judge Noyes says.

In our opinion the defendant's structure infringes. The claim covers the combination of the wire and rubber as a result and we think that the defendant should not be permitted to escape the charge of infringement by combining its wire and rubber in a different way from the stitching or weaving illustrated in the specification.

The decree of the district court is reversed with costs and cause is remanded with instructions to enter a decree for the complainant for an injunction, an accounting and costs.

R. C. H. RE-OFFICERED

Detroit, Mich., Nov. 11—At a meeting of the directors of the R-C-H Corporation last Friday J. F. Hartz, president of the J. F. Hartz Co. and officer and director of various other leading Detroit business concerns, was chosen general manager and treasurer of the corporation. Other officers for the coming year are: President, R. C. Hupp; vice-president, C. P. Sieder; secretary, L. G. Hupp; assistant general manager, F. R. Hupp.

The directors are G. W. Rogers and J. G. Robertson, of Akron; C. G. McCutchin, of Jackson, Mich.; J. F. Hartz, John Kelsey, C. P. Sieder, F. M. Randall, J. H. Clarke and R. C. Hupp, of Detroit. The active management rests with an executive committee of five, composed of Messrs. Hartz, Kelsey, Randall and R. C. Hupp, of Detroit.

MOTOR MEETINGS SCHEDULED

New York, Nov. 12—The anuual meeting of the American Automobile Association has been scheduled for December 2-3 at Chicago. The banquet, which is always a feature of the meeting, will be held at the Auditorium on the evening of December 2. It is expected that the attendance will be very large at the sessions and banquet.

The regular monthly meeting of council of the Society of Automobile Engineers is scheduled for tomorrow.

CHICAGO TRADE CHANGES

Chicago, Nov. 11—There have been several changes on the row of late. A. M. Cobb, formerly manager of the Thomas branch, has succeeded to the position of manager of the Velie branch left vacant by the retirement of Morton H. Luce, who goes to New York representing the Marion and American. George L. Sullivan of New York has been appointed manager of the local Alco branch in place of B. C. Day. R. S. Mattoon, who has conducted an agency for several years, will retire from the motor car business, it is said. Also Charles M. Hayes has severed his connections with the Halladay people.

Thomas J. Hay, formerly manager of the Ford branch, has decided to become a dealer and expects to open up in the spring with a line of cars.

FORD AMENDS PATENT SUIT BILL

Cincinnati, O., Nov. 12—In the suit of the Ford Motor Co., of Detroit, against the Union Motor Sales Co., Lucien A. Howard, J. Carl Horton, Earl Saunby and William T. S. Yocum, of Dayton, Ohio, the complainants today, by leave of Judge Hollister, of the United States court, filed an amended petition. The complainant alleges that the defendants had infringed upon the patent and patent licenses in the sale of Ford cars at a price less than that fixed under the licenses, and that they had conspired with regular authorized agents of the Ford company for the purpose of securing cars under price. An injunction and damages are asked for by the complainant.

OFFER FOR W., C. & P. PROPERTY

New York, Nov. 12—The creditors' committee of Wyckoff, Church & Partridge, Inc., has sent notice to all creditors of the bankrupt concern that an offer for the property has been made to the receiver by Howard C. Dickenson, George A. Allis and Chester Griswold. It has been announced that if the offer is accepted by the creditors the purchasers will form a company to continue the manufacture of the Vaughan car and Commer truck as heretofore. Dickenson and Allis will represent the financial interests and Griswold will act as consulting engineer. C. F. Wyckoff and E. B. Partridge are reported as likely to be identified with the new concern.

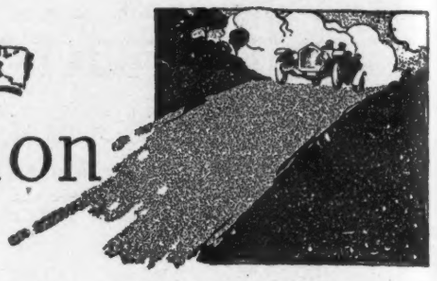
FREY COMPANY BANKRUPT

Buffalo, N. Y., Nov. 12—The Frey Auto Supply Co., of 700 Main street, filed a voluntary petition in bankruptcy yesterday afternoon with the clerk of the United States district court. Total liabilities are said to be $18,500.87 with assets of $22,344.55, most of the creditors being Buffalo firms. The largest creditor, however, is the Lockwood-Luelkenger-Henry Co. of Cleveland, O., which claim amounts to $981.60. Charles L. Helsey is president.

SAVANNAH AFTER 1913 RACES

Savannah, Ga., Nov. 12—Special telegram—The Savannah Automobile Club, after a year's layoff, will re-enter the racing game. At a meeting of the club last night it was decided to file an application for the 1913 grand prix and Vanderbilt cup road races. The stipulation is made, however, that a sufficient number of entries must be guaranteed before the club will undertake the promotion of the classics. Also the formal consent of the military authorities to furnish soldiers to guard the course must be obtained.

Routes and Touring Information



Florida a Land of Motor Enchantment

Asa Paine Continues His Tale of a Tour—Ponce De Leon Spring Located Near Deland—Worst Road Near St. John River—Phosphate Mines at Plant City—Ruins of Old Spanish Missions—Convicts Work on Highways

By Asa Paine
PART TWO

WE found it necessary to return over the same route to Daytona and thence over 21 miles of hard marl roads to Deland, where is located the Stetson university. Many of the orange groves in this vicinity are covered with sheds to guard against frost. About 10 miles northwest of Deland is located the famous and original "honest to goodness" De Leon spring, gushing 60,000 gallons of water per minute, and sought by the early Spanish explorers as the fountain of perpetual youth. Many miles of the roadways in this vicinity have been covered to a depth of about 16 inches with pine needles, making the motor tourist feel as if he were being wafted along on flowery beds of ease, through forests of balsamic pines and sweet-scented orange groves.

Red Clay Roads Found

From Deland we thought we would next head for Tampa. Just how we were going to get there we had not the remotest idea, but as our car was running well and we had negotiated all sandy expanses with becoming ease, our courage had risen to the point to where "fools enter where angels fear to tread." Passing swiftly along over hard roads, some surfaced with a peculiar red clay, we passed the Orange City springs, where quantities of health-giving waters are bottled and sold to the public. The scenery in Florida, except in certain instances, is much the same, and resembles somewhat the crying baby, in that "there is a distressing monotony about it." About 1 mile leading to the St. Johns river is the poorest roadway we found in Florida. It is on the St. Johns flats and during a goodly portion of the summer season must be under water. However, we escaped any trouble, and arriving at the free county ferry, crossed the St. Johns river by a hand-pull-motor of one-cracker power.

Landing on the west bank of St. Johns river, and thence for a distance of 4 or 5 miles to Sanford, we passed through extensive fields of celery, which is grown here by the carload for shipment during the months of January and February. The air is literally perfumed by this nerve tonic. Land here reaches the value of from $100 to $500 per acre.

Proceeding southerly from Sanford, over fine roadway, we next stopped about 30 minutes at the old college town of Winter Park, where nestled among crystal lakes and beautiful orange groves, is Rollins college. A few miles more brought us to the thrifty and enterprising city of Orlando. Putting up here for the night, we found the hotel comfortable. From Orlando one can tour over fine roads to a number of beautiful villages, among which I wish to especially mention Eustis. We decided, on directing our course, first to Kissimmee, which, by the way, is the most lonesome, weird, flee-bitten "cracker-burg" that the writer observed during the trip.

We were informed that beyond Kissimmee, in the neighborhood of Loughman, the sand hills were well-nigh impassable, and that to negotiate the worst 5 or 6 miles of this road frequently took from 3 hours to several days. We negotiated the distance in 38 minutes. The last mile we towed in another car which we found stranded by the roadside. These roads are now surfaced and in condition for touring.

LOOKING ACROSS INDIAN RIVER

Winter Haven and Lakeland have the finest citrus groves anywhere in Florida, especially those in the neighborhood of Florence villa.

Passing through a number of small towns, we spent the night at Plant City, with poor hotel accommodations. Here are immense phosphate mines, which are operated night and day practically the year around. These beds of phosphate form one of the principal ingredients for commercial fertilizer. Almost anything known to the vegetable kingdom can be grown in Florida if the right locality is found and sufficient and proper fertilizer is used. However, so much fertilizer is necessary that in most cases its cost, plus the labor required and transportation charges to market, leaves little or nothing for the farmer.

Farming Outlook Poor

In a tour of several thousand miles through the regions, much of which was sold in 10-acre tracts for from $40 to $400 per acre, the writer can truthfully say that he saw only very few farms able to support the occupant without material aid in the way of tourist crop, or the native live stock. Some species of cattle and semi-wild hogs are able to sustain their emaciated bodies without any assistance from their owners other than a little salt for the cattle.

The famous razor-back is indigenous to this section. Some of them inhabit the swamps and become wild and dangerous and charge their pursuers with great ferocity, foaming at the mouth and gnashing their tusks.

Much of the region we traversed consists of pine forests—interspersed with cabbage palmetto. Many of the pine forests are

now being tapped for pitch by turpentine outfits, and these pine flat-woods, during the months of August and September, are often covered with from 1 to 3 feet of water. The southern and central portions of Florida, known as the Everglades, cannot be reached by the motorist. These Everglades consist of a great body of fresh water dotted thickly with small islands covered with dense vegetable growth. The inhabitants of the Everglade region now consist mostly of about 300 Seminole Indians, a very few whites, negroes, and an interminable number of minute red bugs, which burrow into your flesh, causing no end of discomfort and misery. The idea that a white man can inhabit this section with any degree of comfort or ultimate success is indeed remote, and certainly no motorists would have the temerity to even try to approach these Everglades.

The fresh water rivers are mostly covered with the water hyacinth, and many of the smaller streams are completely choked by this water pest imported from China only comparatively a few years ago.

Continuing westward from Plant City, over somewhat rough and sandy roads, we stopped by the wayside at midday and cooked our first meal, and it certainly was a joy to have real coffee, fresh eggs, bacon and strawberries, with some nice rolls which we purchased.

Ruins of Old Spanish Mission

It would be hardly justifiable for us to travel any further without a snake story. We already had run over and killed a number of harmless snakes, but in going across a marsh where the roadway was being built by a dredging machine my attention was called to a 3-foot water moccasin making the fight of his life to get away from a blacksnake, which was about 5 feet long, and had wound around the moccasin and was slowly but surely choking it to death. I watched the fight to the finish, but before leaving made it doubly sure by beating up the deadly moccasin with a club. The blacksnake was so exhausted from the battle that it scarcely noticed us. Many of the crackers encourage a pair of blacksnakes to make the vicinity of their dwelling their habitat, for the reason that the blacksnake will fearlessly attack any moccasin, diamond-back rattler, or other venomous snake, and will also exterminate mice and small rodents.

SCENE APPROACHING FLORIDA'S EVERGLADES COUNTRY.

Arriving at Tampa Bay about noon, and riding around the city, we noticed that it had been prosperous and was slowly gathering headway again. We were very much interested in the beautiful paintings and other decorations in the interior of the Tampa Bay hotel, a $2,000,000 affair. After the death of Mr. Plant the Tampa Bay hotel was sold to the city for something like $100,000.

Leaving Tampa with its beautiful harbor dotted with shipping, we sped towards Tarpon Springs, over a road unequaled in Florida and where, for a distance of some 50 miles, we could attain a speed of from 50 to 55 miles per hour. Stopping about 10 miles out of Tampa we lunched by the roadside, our unique cooking outfit attracting much attention from other motorists.

We arrived at Tarpon Springs about 3 p. m. and found a neat, homelike hotel, the quiet and rest of which was indeed acceptable. Tarpon springs consists of the outlet of an underground river from a large lake and flows only at certain intervals, and is of no use as drinking water.

Some friends showed us the way, some 15 miles, through the piney woods to Hotel Belleair, which from its sightly location overlooks the gulf and is very popular because of its fine golfing courses and other attractions. It is so well liked by its 300 or 400 patrons that I was told it was impossible to get accommodation during the winter season, unless by special arrangements.

Route to Jacksonville

We retraced our route to Tampa and decided to go from there to Jacksonville by the central route, taking in the towns of Plant City, Dade, Leesburg, Oxford, Ocala, Silver Springs, Gainesville, Waldo, Sampson, Baldwin and thence to Jacksonville. In some places we found sandy roads, but nothing that would hinder a good touring car from making, on an average, 10 to 15 miles per hour. The central portion of the state is in many places very beautiful, and motor tourists travel much of the time through communities in which are beautiful groves of oranges on both sides of the roadway.

The state laws of Florida permit the working of convicts on public highways. We often passed gangs, composed mostly of negro convicts, working the roadway. In some instances permanent buildings are erected with stockades around them, wherein the convicts are guarded while not occupied at hard labor. In some cases where the gangs are often moved steel

RUINS OF AN OLD SPANISH MISSION

PAINE PARTY PICNICS AT DELON SPRINGS

cages on wheels are used, large enough to hold several tiers of bunks sufficient for sleeping twenty-five or thirty convicts. From the sonorous echos which resound from these cages at night the guards term them "opera houses."

The Picnic at Delon Springs, Fla.

Bird life is quite a feature of any motor trip in Florida. The beautiful red birds constantly flit from the branches of trees and among the green palms, also you hear the saucy blue jays and see great flocks of robins and many a covey of quail. Occasionally some wild turkey will break cover when startled by the motorist. Most of the lakes and rivers teem with water fowls and game fish, also oysters and clams.

We always enjoyed our motor trips in Florida and wish to repeat them.

MOTOR BRIDGE ON THE ROAD TO ST. AUGUSTINE, FLA.

MORE SIGNBOARDS NEEDED

San Angelo, Tex.—Editor Motor Age—In the editorial "See America First" in the issue of October 31, Motor Age says "The tourist will have no difficulty in following routes from place to place in Colorado."

During last summer I made a trip to Denver, Colorado Springs, Leadville, Grand Junction, etc., and found the roads good and the tour inexpensive and most delightful, but I did not find the signboards "prolific." For example, I found three intersecting roads without a signboard on any one of them. The people living along the way when asked for direction usually tell you to keep on the plainest road and you won't lose your way. But I did miss the way a number of times and did much driving that signboards would have saved. There ought to be a law in every state regarding permanent signboards at all forks of the roads. Another point of vast importance is to have the sign boards on one road uniform.—M. C. Ragsdale.

MOTOR VISIT TO KENTUCKY

Covington, La.—Editor Motor Age—On a trip from Detroit to Covington which I took a short time ago our journey was uneventful until we left Louisville, Ky. The roads thus far were very good but when we got about 50 miles south of Louisville we began to have some rough travel.

MARDI GRAS TRIP PLANNED

INDIANAPOLIS, IND.—Editor Motor Age—We are planning to attend the Mardi Gras at New Orleans next February and we expect to go in our car. We figure on shipping the car to Nashville, Tenn., and driving the balance of the distance. Is such a thing possible, and advisable? We have about 3 weeks to spend on the trip.

I have traveled in my car in all directions, except the extreme west and south, and I find it hard to meet anyone who has been at the two places mentioned. Is there another road to return over?—Bert B. Goldberg.

It is possible to drive from Nashville to New Orleans, but not advisable. The average temperature around Memphis in February is 44 degrees and too cold for continuous driving. Another thing is the frightful road from Memphis to Clarkdale, Miss., 93 miles. Charles J. Glidden considers this the worst stretch of road he ever has encountered, and although it can be negotiated as demonstrated just recently by Mr. Glidden and also by the pathfinder for the proposed tour, there is very little third-speed work in the process.

It is much the better plan to send your car to Sumner, Miss., which only leaves you 463 miles for a 3-day drive to New Orleans. The popular course is to Jackson, 165 miles, through Whitehead, Glendora, Black Bayou, Schlater, Greenwood, Lexington, Franklin, Goodman, Pickens, Canton, Madison, Ridgeland and Tougaloo. The Jackson-Baton Rouge stretch is 179 miles through Terry, Crystal Springs, Hazelhurst, Beauregard, Brookhaven, Norfield, Johnston, Osyka, Kentwood and Greensburg. The last leg is 119 miles along the levee to Darrow, La Place, Kenner, and New Orleans. The Blue Book No. 3 has running directions to this point.

Then a longer route can be taken on the return. This would take you into Alabama, which lays claim to the best roads of all the southern states. In going from New Orleans to Covington, La., the trip may be made by boat across Lake Pontchartrain to save the 222 miles necessary to get around the lake. By road you route back to Baton Rouge, and then to Magnolia, Dennis Mill, Amite, Hammond, Pontchatoula, Madisonville and Covington. Between New Orleans and Baton Rouge you can take the road on the west side of the Mississippi through Hahnville, Edgard, Donaldsonville, Plaquemine, Fort Allen, and the ferry to Baton Rouge. This is longer by 6 miles.

Before reaching Bogalousa you have a variety of road, 2 miles of it being through swamp land, then from Cameron to Poplarville there are some rough and sandy places but a fine shell road extends from Poplarville to Pass Christian, Gulfport, Biloxi, Ocean Springs, West Pascagoula, where a ferry is taken across the bay to Pascagoula. Mobile, Ala., is reached through Orange Grove. This stretch is not covered with running directions in the Blue Book nor any other publication to our knowledge, but at Mobile you can take up the Blue Book, routing 74 miles through Sasaland, Axis, Chastang, Mt. Vernon, Calvert, Malcolm, Oak Grove, Leroy, Tombigbee river ferry and Jackson. Then Jackson to Montgomery is by way of Grove Hill, Thomasville, Pine Hill, Catherine, Gastonburg, Orville, Selma, Benton, White Hall, Lownsboro, Burksville, Manack, and Montgomery, about a distance of 158 miles.

To reach Birmingham, travel 112 miles, first crossing the Tallapoosa river by ferry and going to McCoy, Wetumpka, Settlement, Marburg, Clanton, Thorsby, Jemison, Montevalla, Silura and Pelham. If you find the weather conducive to a drive all the way to Nashville the best road lies through Village Springs, Oneonta, Brooksville, Guntersville, Deposit ferry, New Hope, Huntsville, Meridianville, Fayetteville, Shelbyville, and Murfreesboro, being 228 miles. You will most probably have to abandon the car at Fayetteville, Tenn.

Road Directions for Motor Age

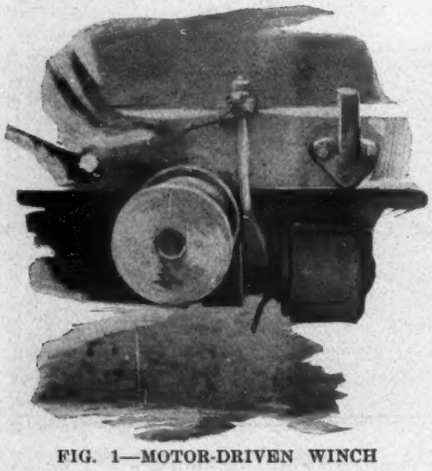


FIG. 1—MOTOR-DRIVEN WINCH

HINTS FOR TOURISTS

Fig. 1 illustrates a motor-driven winch carried by Monsen, who drove one of the Bergdoll entries in the Around-Lake Michigan run, and by which the car literally pulled itself out by its boot straps when it got in a bad mud hole. It is a metal spool on a shaft projecting from the side of the car. The other end of the shaft is geared by bevel gears to the gearset. Throwing the gearset lever to a fourth position puts the gears in mesh and the winch is turned by the motor. A rope wound around the winch and attached to a tree will pull the car out of the worst hole.

Where tire carrying capacity is desired more than comfort in the tonneau, the arrangement illustrated in Fig. 2 may be employed. This was used by the Velie entry in the contest referred to above. The arm between the two forward seats is cut out and a slot cut beneath the upper sill of the forward seat. The tires are centered in the tonneau against the back of the front seat and a strap, passed around them and through the slot, holds them in place.

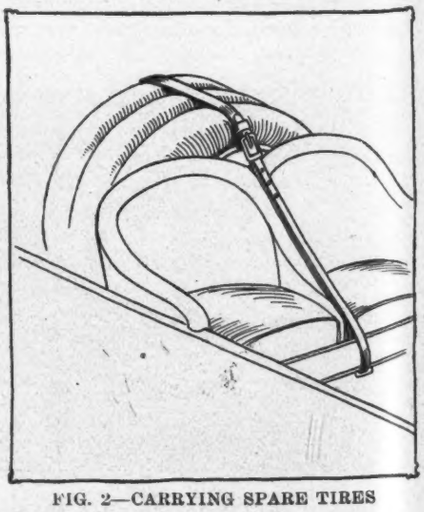


FIG. 2—CARRYING SPARE TIRES

IRON CAGE IN WHICH FLORIDA CONVICTS ARE LOCKED AT NIGHT

The pike is very badly in need of attention, but we followed the regular route to Nashville, Sheffield, Ala., and Corinth, Miss., where we turned south on our own judgment and what information we could gather. At about Bear Wallow we missed the pike and went to Glasgow and found very bad roads to Bowling Green where we got on the pike again.

Leaving Corinth, Miss., we routed through Boonsville, Baldwin, Guntown, Saltillo, Okalona, Gibson, Westpoint, Muldrow, Osborn, Starkesville, Bradley, Ackerman, French Camp, Kosciusko, Thomastown, Camden, Canton, Ridgeland, Jackson, Terry, Crystal Springs, Hazelhurst, Beauregard, Wesson, Brookhaven, Johnson, Summit, McCombe, Magnolia, Osyka, Kentwood, Tangipahoe, Amite, Tickfaw, Hammond, Ponchatoula, Madisonville, Covington.

When we reached Ackerman, Miss., a heavy rain set in and continued until we got home. At Jackson, Miss., we put ropes on the front wheels and then could not keep out of the ditches. For 3 miles we had a mule team to keep us in the road. The condition of this road was fierce. It had just been thrown up and with a week's rain soaked into it, there surely was gumbo. The wheels with heavy chains turned as if the car was jacked up under the fenders and back springs. The gumbo caked under the fenders so that the back wheels were turning around in it like a trick machine. These roads have all been fixed up now, with a coating of gravel and shell. Our car was an E-M-F and the engine behaved beautifully. We used one set of casings, one blow-out patch and one extra inner tube. We had one blow-out and three punctures.—J. L. Smith.

BEST PORTLAND-SALEM ROAD

Motorists traveling between Portland and Salem seem to be deserting the Pacific highway, which goes through Oswego, Oregon City, New Era, Canby, Barlow, Aurora and West Woodburn, for the west road by way of Tigard, Rex, Newberg, Dundee and Dayton. This west road is reported by far the smoother, freer from dust and of much greater scenic beauty, and few rough stretches are encountered.

Readers Planning Long Tours

It is also possible to go from Birmingham to Chattanooga, Tenn., either direct, or by way of Huntsville; also from Birmingham to Atlanta, Ga., and Chattanooga.

WOULD TOUR TO FLORIDA

Kokomo, Ind.—Editor Motor Age—Would it be safe to start from Indiana to Florida in December or January? Is there a good road all the way to Florida?—G. W. Curran.

It would be advisable to ship your car to Nashville, Tenn., and if the weather seems to be unusually cold send it to Fayetteville. From this town you route to Birmingham through Meridianville, Huntsville, New Hope, Deposit ferry, Guntersville, Brooksville, Oneonta, Village Springs.

Routing 190 miles to Atlanta, Ga., the towns are Gate City, Trussville, Argo, Springville, St. Claire Springs, Asheville, Greensport, Peeks Hill, Anniston, Oxford, Iron City, Edwardsville, Talapoosa, Waco, Bremen, Temple, Villa Rica, Winston, Douglasville, Austel, and Mableton. Between Atlanta and Augusta there is mostly gravel roads. The 171 miles through Decatur, Ingleside, Clarkson, Stone Mountain, Redam, Lathonia, Rockdale, Covington, Social Circle, Rutledge, Madison, Greensboro, Union Point, Crawfordsville, Camak, Thomson, Bonesville, you will find some stretches of clay, the worst being between Madison and Greensboro.

With 60 miles of sand on the best road between Augusta and Savannah, it is 133 miles through McBean, Waynesboro, Perkin, Millen, Scarboro, Rockyford, Statesboro, Pretoria, Stillson, Blichton, Pooler and Savannah. Then it is 177 miles to Jacksonville, Fla., through Freedman's Grove, Riceboro, Eulonia, Darien, ferry to Dents, Brunswick, Old Sterling, Tarboro, Owens ferry, Kings ferry and Callahan. At Darien the charge is $5 for the ferry, and at Owens and Kings ferry they are $1.

NATIONAL ROAD TO NEW YORK

Middeport, O.—Editor Motor Age—I am contemplating a trip to Washington and New York. If I take the National road at Zanesville what large towns will I pass through. I want to route by way of Annapolis, Baltimore and Philadelphia to New York and want the distance going this way.—E. Ohlinger.

The National highway extends through the following towns: First it is 72 miles to Wheeling, W. Va., through Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendricksburg, Morristown, Loydsville, Bridgeport and Wheeling. Cumberland, Md., is 133 miles from Wheeling, the principal towns being Elm Grove, Claysville, Washington, Laboratory, Scenery Hill, Beallsville, Centerville, Brownsville, Haddonville, Uniontown, Farmington, Thomasdale, Somerfield, Addison, Oakton, Grantville and Frostburg. It is 135 miles to Washington, D. C., through very attractive country and the towns of Flintstone, Gilpin, Town Hill, Hancock, Indian Springs, Clear Spring, Hagerstown, Funkstown, Boonsboro, Middletown, Braddock, Frederick, Hyattstown, Clarksburg, Gaithersburg, Rockville and Dupont Circle. From Zanesville to Washington, D. C., it is 397 miles.

Washington, D. C., to New York via Annapolis, Baltimore and Philadelphia is a distance of 299 miles. The routing to Annapolis is Bladensburg, Laurel, Elkridge, Relay, Lansdowne, Pumphrey, Marley, Boone, Arnold and Annapolis. To Baltimore the towns are Arnold, Boone, Marley, Brooklyn, being over shell road most of the way. Philadelphia is 108 miles distant in the most part macadam through Woodbrook, Towson, Lock Haven, Glenarm, Bel Air, Churchville, Havre de Grace, Perryville, Northeast, Elkton, Newark, Marshallton, Wilmington, Concord, Chelsea, Village Green, Felton, Darby. Also most of the road on to New York is macadam, the itinerary being Ogontz, Bustleton, La Trappe, Janney, Langhorne, Glen Lake, Oxford Valley, Trenton, Lawrenceville, Princeton, Kingston, New Brunswick, Metuchen, Menlo park, Elizabeth, Newark, Weehawken ferry to New York.

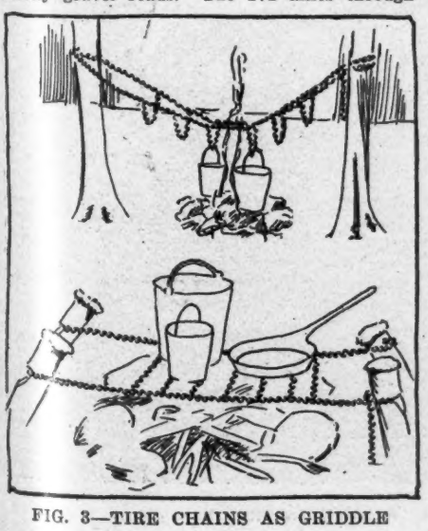


FIG. 3—TIRE CHAINS AS GRIDDLE

HINTS FOR TOURISTS

Antiskid chains can be utilized in camp as well as on muddy roads. This is illustrated by Fig. 3, where they make cooking on the campfire easy. Two methods are shown, the lower one being preferable if there is sufficient energy left in the party to cut and drive the stakes.

Any one who has taken an extended tour probably has found occasion to bemoan the fact that he had not a spare supply of gasoline on board. Fig. 4 illustrated how a 5-gallon can of gasoline may be carried on the running board for emergencies. An iron strap in circular form is welded to another bent at right angles and its end bolted to the under side of the running board.

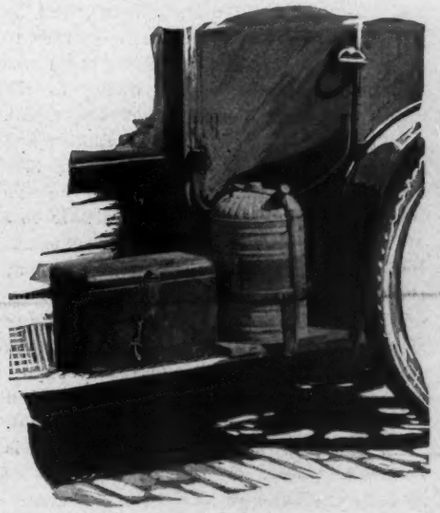
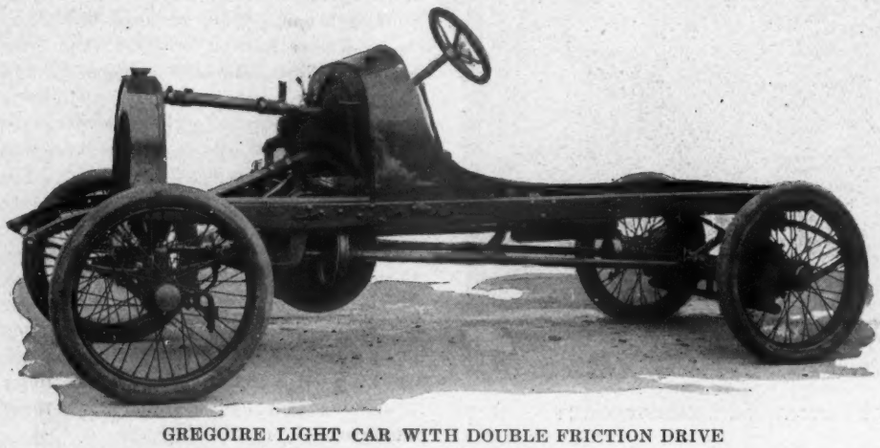


FIG. 4—EMERGENCY GASOLINE CAN

More About the New French Models

Very Light One-Cylinder, Friction-Drive Car Is the Latest



GREGOIRE LIGHT CAR WITH DOUBLE FRICTION DRIVE

Editor's Note—This is the second one of a series describing the new French motor ideas. The first installment was published last week.

By W. F. Bradley

DARRACQ has decided to specialize next season on the rotary valve motor built under Henriod patents. There will be two types of car with this motor, one being a four-cylinder monoblock of 2.9 by 4.7 inches bore and stroke, and the other of 3.3 by 5.1 inches bore and stroke, also a monoblock casting. In addition, a poppet valve model of 3.9 by 5.5 inches will be produced. The big valveless model, of 3.5 by 5.5 inches has been abandoned. There have been several changes in the motor as the result of the practical experience of the past 12 months. The distributor is now driven by a silent chain from the crankshaft, and revolves at half the speed of this latter; originally it was operated by worm gearing and a vertical shaft.

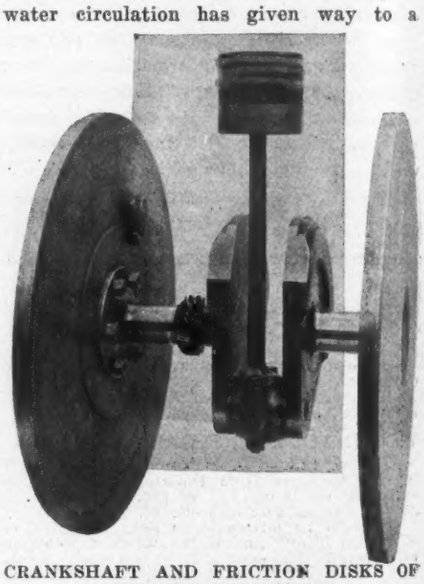
Numerous oil grooves are now cut on the surface of the distributor, these having the advantage, in addition to retaining a greater quantity of lubricant on the surfaces in contact, of preventing the scoring of the walls, for any particles of metal become embedded in one of the grooves.

Change in Henriod Motor

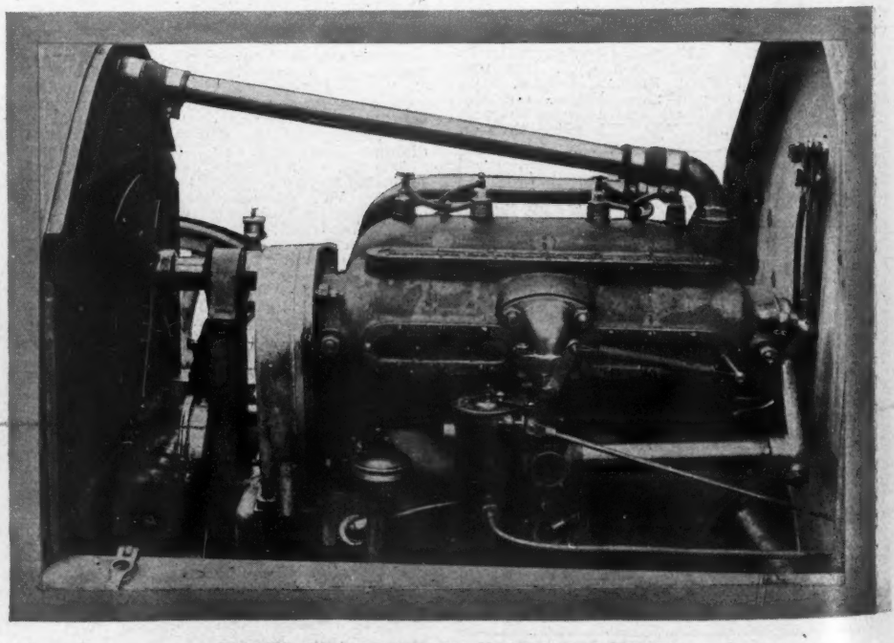
Formerly the four D sections of the distributor, giving communication between the combustion chamber and either the intake or the exhaust port, had a perfectly flat face. It was found, however, that by changing from the single plain surface to two forming a very wide angle, there was less possibility of trouble owing to the expansion and contraction of the metal. The tolerance between the distributor and the tunnel in which it revolves is .002 inch, the distributor not bearing on the walls, but being carried in a double row of ball bearings at each end. The masking of the distributor by the piston at the moment of explosion is one of the essential features of this design. It is only when the piston has accomplished about one-sixth of its downstroke that the port is uncovered and that the spent gases can be liberated by means of the distributor.

On the new models the distributor is hollow and advantage is taken of this to draw air through it for the carbureter. The cold air is taken in at the front end, where the extremity of the distributor passes through the chain cover, and is forced along by means of a small turbine mounted on the rear of the distributor. The dashboard end of the distributor is connected up to the carbureter by a brass pipe. The arrangement tends, in a certain measure, to cool the distributor and also supplies warm air to the carbureter. The distributor is also responsible for driving the dashboard lubricator through an eccentric mounted on the rear end. The method of oiling is a modified system of splash, oil being passed through the sightfeeds on the dash to the three main bearings, into oil rings, and through oilways bored in the crankshaft to the connecting rod ends. In addition, the crankchamber is divided into four compartments, and quill dippers are fitted on the end of each connecting rod. There is no special lead to the distributor, it being found that the amount of oil taken from the cylinder walls through the port is quite sufficient.

The pistons are now fitted with four rings, two of them being above the wrist pin, one around it, and the fourth near the base of the piston. This last ring is below the port when the piston is at its upper dead center and serves to prevent leakage from the distributor passageway in the crank chamber. Thermosyphon water circulation has given way to a



CRANKSHAFT AND FRICTION DISKS OF GREGOIRE LIGHT CAR



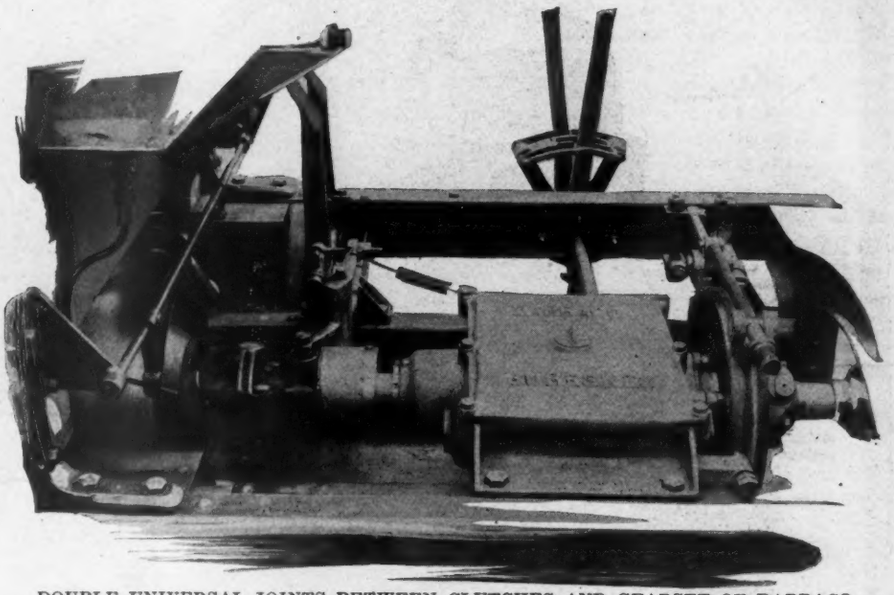
INTAKE SIDE DARRACQ VALVELESS MOTOR

Darracq, Gregoire and C. & W. Products

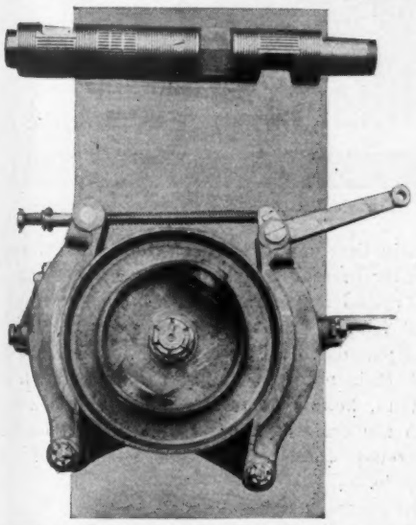
Rotary Valve Motor Shows Refinement—Transmission Brakes Used

forced flow by centrifugal pump, the pump and magneto being driven off the same shaft on the right-hand side of the motor. The stuffing gland of the water pump is kept tight by a coil spring, there being no external adjustment. It is to be noted, too, that with the change from thermosyphon to forced water flow, the dashboard radiator has been abandoned, the new models having a gilled tube Arecal radiator in front with a belt-driven fan behind it.

The Darracq construction is unique by reason of a very extensive use of cast iron; in the motor the only aluminum castings are the covers for the chain housing and for the water pump. To the rear of the dashboard only the cover of the gearbox is of aluminum. The cone clutch is of pressed steel.



DOUBLE UNIVERSAL JOINTS BETWEEN CLUTCHES AND GEARSET OF DARRACQ



NEW ROTARY DISTRIBUTER AND BRAKE OF DARRACQ

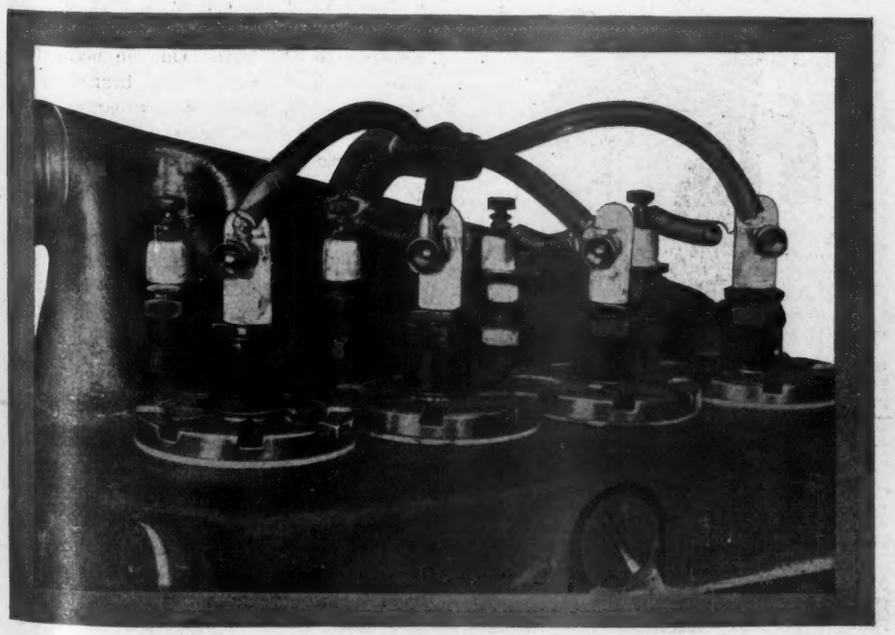
A double universal joint between clutch and gear box is a new feature and, unlike previous years, the gearset on all models provides four speeds and reverse. There are two sliding sets, the first one giving fourth and third, and the second one second, first and reverse. There is no change in the manner of mounting the power plant and gearset on a subframe received on transverse members at front and rear. The final drive is by propeller shaft contained within a torque tube. Rear suspension is now by means of three-quarter elliptic underslung springs. Darracq this year is making use of a detachable type of wood artillery wheel.

New Friction Drive Car

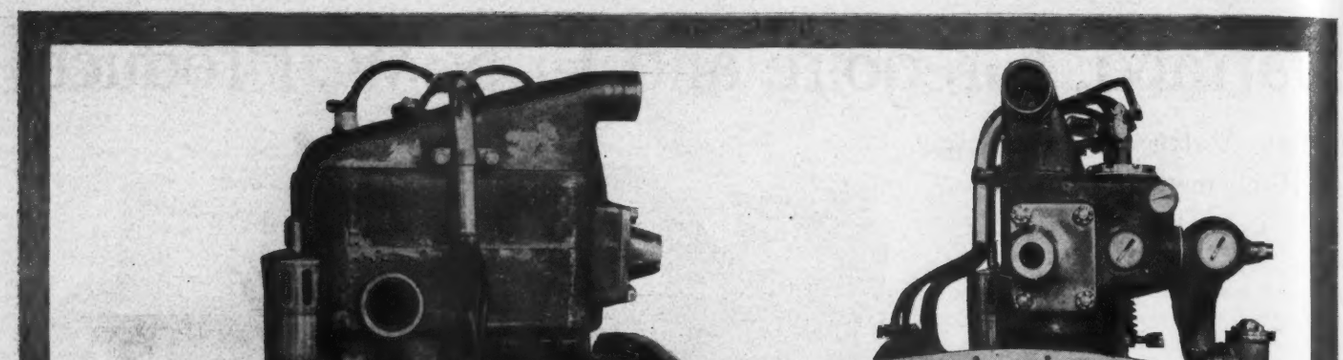
Up to the present, friction drive has not met with a great amount of success in Europe, the few manufacturers who have adopted it having found the public reluctant to buy. This has not prevented the Gregoire company specializing on a light friction-driven model and even erecting a special factory for its construction, thus in no way interfering with the normal production of the higher grade cars. The Gregoire friction type is distinctive by reason of two separate drives—one to each road wheel, with bevel gearing in the rear axle and no differential.

The motor is a single cylinder of 3⅜ by 6 11/16 inches bore and stroke, distinctive by reason of the very large diameter valves fitted, and having thermosyphon water circulation and high-tension magneto. The motor is set across the car, with a large diameter disk bolted to flanges on each end of the shaft. In contact with each disk is a fiber-faced friction plate carried on keyways cut on a long propeller shaft. At the rear of the shaft is a bevel pinion meshing with a crown bevel within a housing and giving final drive to one road wheel by means of a short live axle. By reason of the great length of the shaft there is no necessity for universal joints, and with two independent drives the use of the differential can be abolished without any ill results.

Originality has been shown in the design of the car. Thus, the motor, steering gear and control mechanism are all mounted on a separate frame attached to the main channel section frame members. This frame comprises two tubular transverse members, the rear one having the



DOUBLE SPARK PLUGS ON C. & W. MOTOR



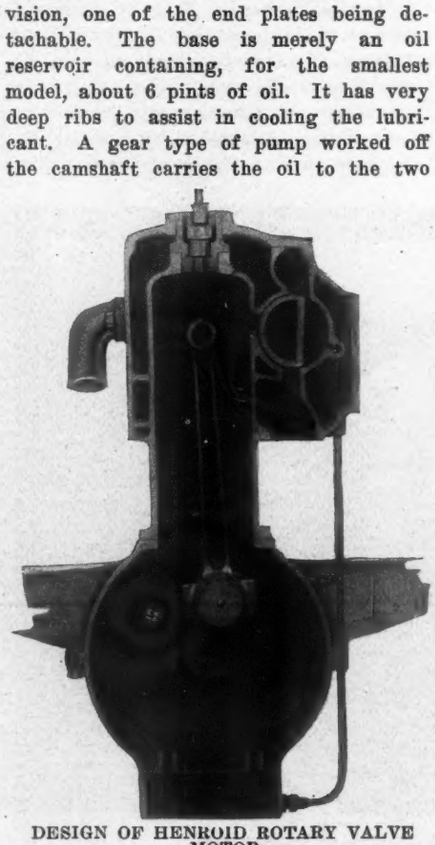
SIDE AND END VIEWS OF CHENARD & WALCKER 10-HORSEPOWER MODEL

crankchamber attached to it by means of hangers, and also carrying the brake pedal, the accelerator pedal, and a support for the steering column. The front transverse member also receives the crankchamber, the steering gear box and the bevel gearing and chain pinion by means of which the motor is cranked in front. These two transverse members are united by specially-shaped longitudinal frames placed on and bolted to the main frame members. Each propeller shaft is carried at its forward end in a swan neck bracket attached to the motor frame. The friction plates are connected up so as to be movable fore and aft on their shafts through the operation of a side lever.

At the front, semi-elliptic springs are fitted; at the rear three-quarter elliptics are employed. The chassis has the advantage over many friction-driven types of affording full protection for the mechanism, for the bevel gearing works under the same conditions as that on the orthodox type of car and the friction disks are given protection by an underpan. So far as external lines are concerned the car harmonizes with the usual types. It has a sloping bonnet and a scuttle dash with the tank in it. It is being offered with a four-seater body and will be put on the market, probably, round the $800 mark.

Lubrication Feature of C. & W.

A distinctive feature of the Chenard & Walcker models is the lubricating system as now applied to all four types produced by the firm. There are three four-cylinder motors having dimensions of 2.7 by 5.1, 2.9 by 5.9, and 3.1 by 5.9 inches. A new six-cylinder being prepared for the Paris salon also measures 3.1 by 5.9 inches bore and stroke. With the exception of the six-cylinder, the models have two bearing crankshafts received in a crankcase with no central horizontal division, one of the end plates being detachable. The base is merely an oil reservoir containing, for the smallest model, about 6 pints of oil. It has very deep ribs to assist in cooling the lubricant. A gear type of pump worked off the camshaft carries the oil to the two main bearings and from there it is driven under pressure to the connecting rod ends of cylinders No. 1 and No. 4 through internal oil leads. The normal pressure is about 14 pounds to the square inch. The crankshaft is not bored right through, but, instead, hollow aluminum pieces are bolted on the crankshaft webs, and the oil leads through these pieces form an arc of a circle.



DESIGN OF HENROID ROTARY VALVE MOTOR

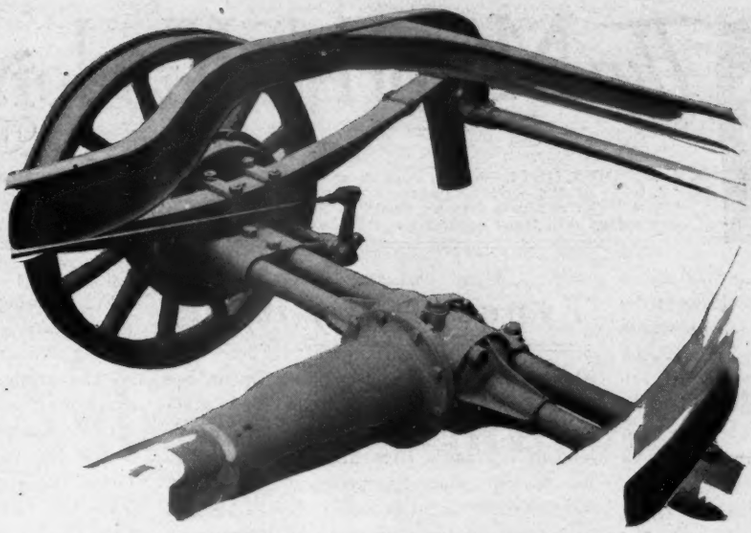
Oil Pressure Relief Valve

The oil taken to the connecting rods of cylinders 2 and 3 is thus at a constant distance from the center of rotation, and centrifugal force does not oppose any resistance to the flow. On the main feed pipe, which is a copper tube brazed in the crankchamber, there is a pressure relief valve allowing the excess oil to flow into a separate housing containing the valve operating mechanism. A constant level is maintained in this chamber, the overflow being carried to the silent chain mounted in an individual compartment at the front.

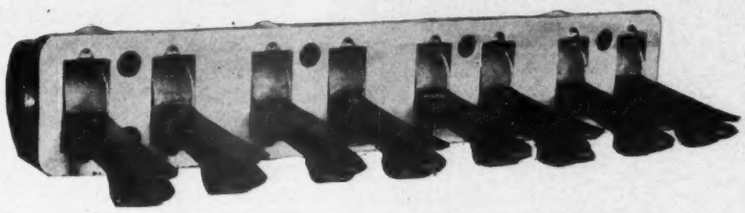
Provision has also been made for automatically maintaining the level of oil in the sump. On the front of the dashboard is a reserve tank also containing 6 pints of oil—on the smallest model—and having a tube communicating with the sump through the crankcase breather. The length of the tube is such that its extremity is just submerged when the correct level is maintained. As soon as that level is lowered, exposing the end of the tube, air rushes in and a flow of oil is set up from the reserve tank until the extremity of the tube is again submerged. There is a tap on the pipe from the reserve tank

to the sump in order to stop the flow when the filler cap is unscrewed. Except when filling up this tap must be kept open. On the dash is a glass dial showing the level of oil in the tank. With this system the only attention required is to the reserve tank.

A Reynolds silent chain is now used on all models for driving the camshaft and the magneto. Slack in the chain is taken up by adjustment of the magneto. This latter is mounted on a separate cradle behind the timing gear housing, this cradle resting on a platform cast with the crankchamber and having two slots through which pass two bolts projecting rearwards from the timing gear housing. When the nuts on these bolts have been slackened off, a lateral movement can be given to the cradle together with the pinion, drive shaft and magneto, by means of a set screw, thus getting any desired adjustment and varying the tension on the chain. Very light steel pistons are used for these models, those on the 2.7 inch bore motor having 2 rings only and a wrist pin with the diameter of 1.1 inch.



REAR AXLE CONSTRUCTION ON CHENARD & WALCKER MODELS



FLAT BLADE SPRINGS IN C. & W. VALVE GEAR

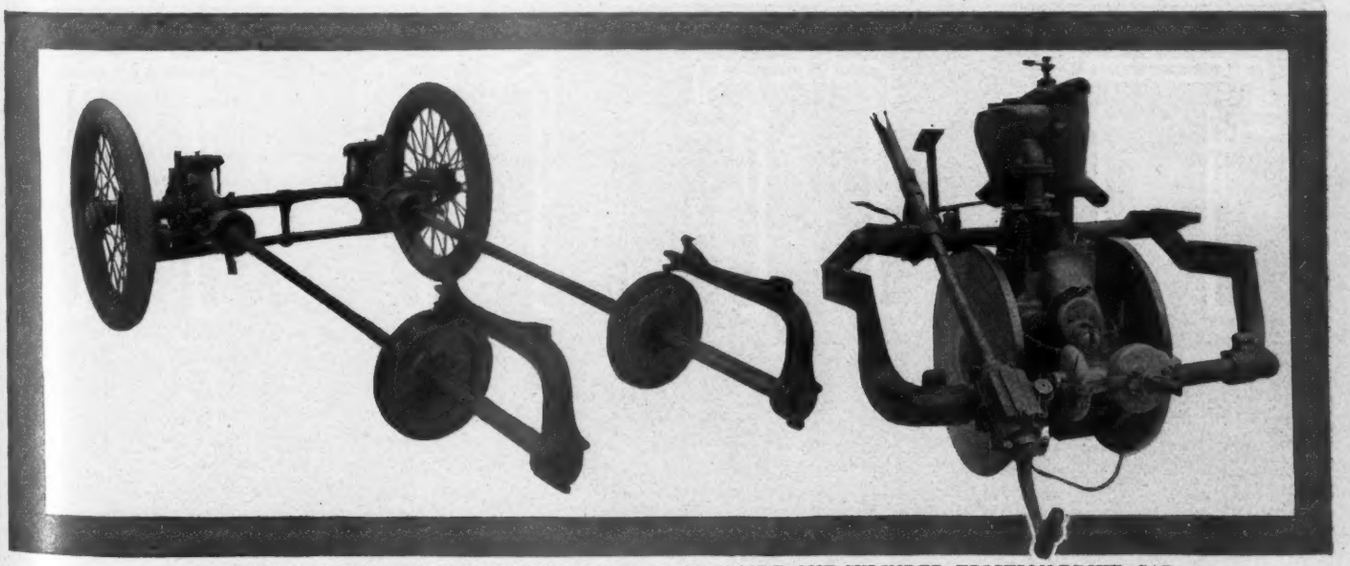
New Idea in Valve Tappets

The cams do not come in direct contact with the tappets, but between each is interposed a lever having a flat blade spring attached to it. The whole of the eight levers and springs are mounted on one shaft put in through openings on the side of the crankchamber and secured on projecting studs. This mechanism, coming between the cams and the tappets, is consequently in the same chamber as the camshaft and has the advantage of the constant level of oil. The result is very silent operation, for not only have the springs to be compressed on the levers, but the film of oil between the two surfaces has to be driven out before the valve lifts. With this disposition adjustable tappets are not essential.

One of the features of the new models is the use of two spark plugs mounted in series and fired by an ordinary Bosch magneto. One of the plugs is over the valves—there is but one valve cap for each pair of valves—and the other is mounted in the head of the combustion chamber, the outlet water pipe being specially recessed to allow for the placing of the second series of plugs. The plugs over the valves have two insulated points, one of these points being connected up to the magneto distributor and the second united to the ordinary plug in the cylinder head. Since adopting this method variable advance has been abolished, and it is declared by the factory engineers that with an ignition advance of only $\frac{3}{16}$ inch the same results are obtained as formerly with an advance of $\frac{5}{8}$ inch. Further, there is a decided economy in fuel.

Four-Speed Gearsets

The gear box, of remarkably small area, is cast with detachable end plates carrying the bearings for the two shafts placed one above the other. The box is not divided horizontally. There are four speeds on the selective principle, the three sliding sets being as follows: for first and reverse, for second only, and for third and fourth. Chenard & Walcker has a type of final drive differing from that usually employed on European cars. The rear wheels are mounted on a dead axle having the differential housing bolted to it. The drive shafts are independent, each one carrying at its extremity a spur pinion meshing with an internal gear within a drum on the road wheels. With the double reduction it is possible to have a differential housing of very small dimensions. The fore-and-aft shaft is carried within a torque tube attached at its forward end to one of the transverse frame members by means of a collar and a stout rubber ring. This rubber ring has a series of holes bored through it to increase its flexibility is a tight fit on the end of the tube, and it is encircled by a collar attached to the transverse frame member.



TRANSMISSION MEMBERS AND POWER PLANT OF GREGOIRE ONE-CYLINDER FRICTION-DRIVE CAR

The Motorist's Kindergarten

EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car.. The first article appeared October 10, 1912.

TWO most usual valve locations were mentioned last week: one, in which the intake valves are on one side of the cylinder and the exhaust valves on the other side of the cylinder, giving the T-head form of cylinder; and the other in which both the intake and exhaust valves are on the same side of the cylinder, producing the L-head type of cylinder. These two arrangements are illustrated in the first two sketches at the left of Fig. 8.

Instead of having both valves in pockets at the sides of the cylinder casting, one or both of them may be placed in the top of the cylinder, right over the piston. The third sketch in Fig. 9 illustrates an arrangement in which one of the valves is located in the top of the cylinder and the other in the side. It will be seen that the valve in the top of the cylinder opens downwards instead of upwards as the other one does; in fact, the one in the top is just upside down as compared with the other.

To open it, the end of the valve stem has to be pushed down. But the cam pushes up to open the valve; so the push rod is extended up to above the top of the cylinder, where it is hinged to one end of a short lever called the rocker arm This rocker arm is pivoted at or near its center to a lug sticking up from the top of the cylinder and its other end rests on the upper end of the inverted valve stem. When the cam lifts the push rod the latter lifts the end of the rocker arm to which it is attached, and the other end of the rocker arm swings down, pushing

Types of Cylinders

the valve down with it. This opens the valve. A spring between the valve stem guide on top of the cylinder and the upper end of the valve stem brings the valve up to its seat when the pressure on the end of the rocker arm is removed.

In arrangements of this sort, where one valve is in the top and the other in a pocket in the side of the cylinder, both valves usually are operated by one camshaft. It will be seen that the cylinder has the L head just the same as when both valves are on the same side. Usually, where one valve is in the head and the other in the side of the cylinder, the one in the head is the exhaust valve and the other the intake. This is because there is room to make a bigger valve opening in the top than would be feasible in the pocket at the side and the exhaust gases ought to have more room to get out than the inlet gases need. Why this is true will be explained later.

In older types of motors and in motor cycle engines today the inlet valve often is the one in the head or top of the cylinder. These usually are what is called atmospheric or automatic inlet valves because they do not need to be operated by the cam or other mechanical means and consequently need no pushrods or rocker arms. They are just like the one shown in the third sketch of Fig. 8, except that the pushrod and rocker arm are left off. The spring is so adjusted that the suction of the downward movement of the piston on its admission stroke overcomes the pressure of the spring and draws the valve down, sucking in the fresh mixture. During the downward movement of the piston on its power stroke the pressure of the burning gas keeps the valve closed and at all other times the spring keeps the valve closed. The chief difficulty of this type of valve is that it requires very delicate adjustment of the spring and has been generally abandoned in motor car engines in favor of the positive or mechanically operated valve. In one or two instances the automatic intake is retained with success.

There is a fourth quite general arrangement of the valves in the cylinder. This is the location of both the intake and exhaust valves in the head or top of the cylinder, as illustrated at the right of Fig. 8. With this arrangement both the intake and exhaust valves are operated through rocker arms in the same way that the exhaust valve is in the head-and-side arrangement. It will be noticed that the cylinder casting is straight up and down. This type of cylinder is variously known as valve-in-the-head, I-type or barrel-type.

The function of the valves is to let the gas in and out of the cylinder, and the more quickly this is done the faster the motor may run and the less back pressure there will be for the piston to work against. Other things being the same, the larger the diameter of the valve opening, the quicker will the gas get out. If the inlet passages and valve opening are small the cylinder will not fill promptly with the

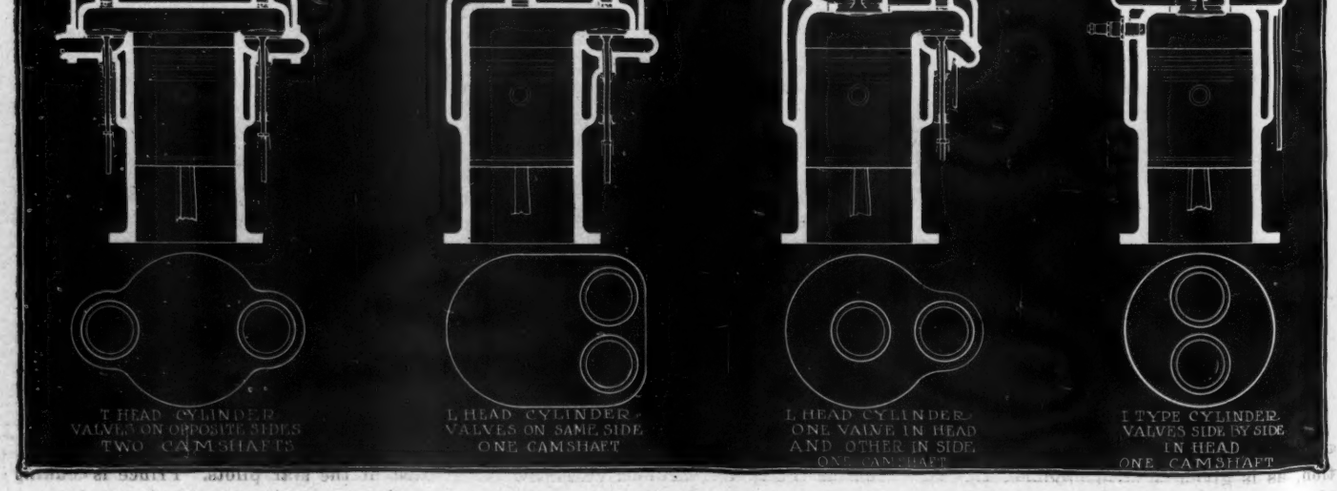


FIG. 8—HOW LOCATION OF VALVES CHANGE SHAPE OF CYLINDERS

explosive mixture, and if the exhaust passages and valve are small the dead gas does not all get out and the next charge of fresh gas will be diluted with dead gas, which makes the mixture burn slowly and cuts down the power of the motor.

The valve-in-the-head type makes the most efficient motor, for both intake and exhaust gases pass directly from the cylinder. The L-head cylinder, where one valve is in the head and one in the side, probably is next in efficiency, for one of them opens directly into the cylinder and can be as large as desired up to the diameter of the bore of the cylinder. The other valve, which is in a pocket at the side, gives a longer passage for the gas to pass through before it gets out, which means the gas cannot get out so fast. The T-head cylinder is not so efficient as the others mentioned because neither valve has a direct opening to the cylinder, but they can be as large as desired. This type has the disadvantage that two camshafts are needed, making the installation more expensive and heavy.

L-head motors with both valves in pockets on the side are the least efficient type in general of the four, simply because there is not room to make the valve as large as they otherwise could be made and the gas passages are not direct. They have the advantage, however, of using only one camshaft, which makes them cheaper to construct and lighter than the T-head motor, while the valve-operating mechanism can be readily inclosed and made silent, which is not generally true of the other two types of motors mentioned.

Alloys, Axles and Ignition Discussed

Detroit S. A. E. Listens to Three Most Interesting Papers

DETROIT, Mich., Nov. 8—At last night's regular monthly meeting of the Detroit section of the Society of Automobile Engineers, at which Secretary and Treasurer Alfred A. Greenburg presided in the absence of Chairman E. T. Birdsall, three very interesting papers were presented.

The first of these was given by William H. Barr, general manager of the Lumen Bearing Co., Buffalo, and chairman of the alloys division of the society. The subject was "Copper Alloys for Motor Car Service," and it was treated in a masterful manner by Mr. Barr, who gave a short history of copper. He stated that in the United States the metal is usually classified in three grades: Lake copper, that brought from the Lake Superior region; electrolytic copper, that refined by the use of the electric current; and casting copper, that which is not entirely refined, but carries varying amounts of impurities, and as a result is rapidly disappearing from commercial fields.

The United States produces more copper than any other country, or about 65 per cent of the total production of the world, the total amount for 1911 being 1,090,000,000 pounds.

Mr. Barr also touched upon the production, refinement and commercial uses of the various metals which are alloyed with copper to make bearing metals, viz., tin, zinc, lead. Brasses and bronzes were taken up at some length and the action of such chemicals as arsenic, antimony and sulphur on these alloys was explained. These three elements have a detrimental effect upon bronze, but sulphur in proportions which have been carefully determined by metallurgists is a beneficial agent.

The high copper alloys, as related to motor car construction, may be divided into four classes: Soft phosphor bronze, hard phosphor bronze, red brass, yellow brass. The properties, uses and general composition of these were explained.

"From the standpoint of the motor car engineer, it would seem that the same detailed attention should be given to the non-ferrous alloys in motor car construction, as is given to steel products and appliances. Too often, the decision as to what brass or bronze may be used, is left to the purchasing department, where price alone governs the selection," said Mr. Barr.

In the discussion of the paper which followed it was asked if there would be any value to any means of hardening copper. Mr. Barr stated that no way has been found to harden pure copper. He also brought out that there are two concerns now making copper castings in which it is possible to guarantee an electrical conductivity of 85. Ordinarily, a conductivity of from 45 to 60 is considered good.

C. C. Hinkley wanted to know if it were possible to get a combination of low shrinkage and high wear in a babbitt metal. To this Mr. Barr replied that an alloy containing not less than 90 per cent. of tin, 4 per cent. of copper and 6 per cent. of antimony would come as close to these requirements as any. Perhaps a little less tin could be used. The antimony serves to reduce the shrinkage.

When asked if a small percentage of nickel would be of advantage in these alloys, Mr. Barr stated that as a result of many tests he has come to the conclusion that nickel is of little or no advantage. The effect of cobalt or any other similar element is about the same as that of nickel. He does not believe in nickel babbitts.

This discussion was followed by a paper by Maurice Wolf of the Anderson Forge and Machine Co., Detroit, which paper treated upon the B&L caster front axle, setting forth its construction and the advantages which are claimed for this type over the standard front axle. A paper which was in the form of a discussion of that of Mr. Wolf was read by Ernest R. Fried, research engineer of the General Motors Co. Mr. Fried did not agree with all the claims made by Mr. Wolf.

A most comprehensive paper by Ray H. Manson, chief engineer, Dean Electric Co., Elyria, O., entitled "High-Frequency High-Tension Ignition," was next presented. According to Mr. Manson, the use of high-frequency high-tension electric spark for ignition in the internal combustion engine introduces several unique and advantageous features. A high-frequency discharge is in the form of electrical oscillations, these oscillations rapidly succeeding one another, each succeeding one being of less intensity than the one preceding, and gradually dying down to zero. This electrical oscillatory action is similar to the mechanical vibration of a strip of metal or a tuning fork, which is firmly held at one end in a vise and struck by a blow. Its first vibration is the maximum, those following finally reducing to nil. The chief advantages which Mr. Manson gave for this type of ignition are:

1—Cranking on magneto at very low speeds.

2—Throttling the engine down to extremely low speeds without missing.

3—Positive ignition of poor mixtures.

4—Less heating of engine, due to more rapid and thorough combustion of gases.

5—Fuel economy, due to ability to ignite lean mixtures positively.

The high-frequency magneto system consists of a low-tension magneto with breaker-box and low-tension distributer, built very similarly to a standard magneto with the exception that the armature is wound with fairly coarse wire and that the condenser is stationary. It is located on the front of the distributer.

In addition to touching upon the high-frequency magneto system, Mr. Manson explained the high-frequency dual system, battery system and double system. The paper was necessarily brief.

BOOMING DALLAS SPEEDWAY

Dallas, Tex., Nov. 9—Jack Prince, who is booming the scheme to erect a 1½-mile board speedway in this city, reports that he has interested several of the prominent business men of Dallas in the proposition and that the deal most likely will go through. It is planned to have the first meet in April. Dallas' only fear is that enough entries cannot be secured to make the track a success, but Prince claims he already has assurances of support from most of the star pilots. Prince is making his headquarters at the St. George hotel.

Right or Left-Hand Drive

Advantage Is on Both Sides for American Roads and Customs

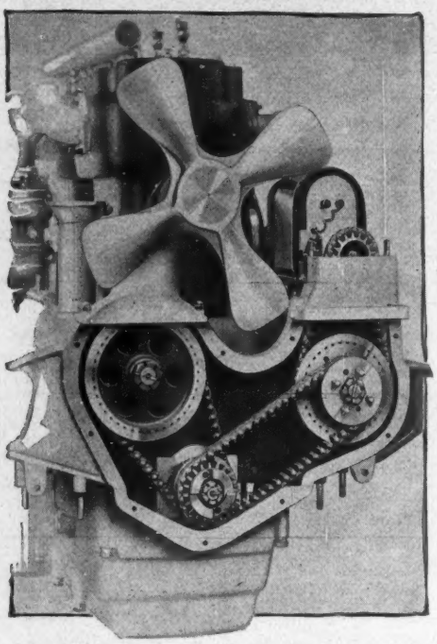


FIG. 1—CHAIN TIMING DRIVE ON STEARNS-KNIGHT

PITTSBURG, Kan.—Editor Motor Age—I would like an explanation as to why some of the car manufacturers are building their models with left-hand drive.

2—What are the advantages and disadvantages of the left-hand drive?

3—What are the rules of the road as required by law?

4—I understand that the pressure-feed system gives more power. If so, why?

5—On the 1912 Hudson 33 touring car is a dash adjustment for the Stromberg carbureter. What is the object of this adjustment?

6—What is the horsepower of the Hudson 37 by brake test?

7—Has Henry Ford sold the Ford factory? If so, to whom?

8—What is the address of the makers of the Delco electric system?

9—Are there any piston head packing rings superior to the Leak-Proof rings?

10—In making alcohol from corn stalks for motor fuel, what is added to the alcohol?

What is the cost of making 1 gallon of this fuel? Is it better than gasoline, and, if so, what percent?—W. E. Sanders.

1—Makers are using left-hand drive in response to public demand. If there were no demand none would attempt to supply it. The fact that the supply is present indicates the presence of a demand. The fact that the supply is growing indicates a growing demand.

2—The advantages advanced for left-hand drive are as follows:

A—In passing other vehicles the driver is on the proper side to observe how close he is to the passing vehicle. In passing vehicles going in the same direction he is on the proper side to observe whether or not there is a clear passage.

B—In making turns, the driver of a left-hand driven car is on the high side of the road, and nearest the center.

C—In drawing up to a curb the driver is on the outside, permitting ingress and egress on the right side, not necessitating the occupants of the front seat getting out and in on the left side and walking through the mud.

D—In drawing away from a curb, the driver is in a position to observe the cars which may be passing, if on the left side.

E—With the driver on the left side, the control levers may be placed in the center of the car, and yet be convenient for right-hand manipulation.

These differences are shown in Figs. 2 and 3, in which Fig. 2 illustrates the advantages of left-hand drive and Fig. 3 the disadvantages of right-hand drive.

But there is another side to this question, as there is to any question. The advocates of right-hand drive advance the following points:

A—In passing to the right of another vehicle, especially in a country road, the driver of a right-hand driven car is in a position to see how close to the ditch he may allow himself to approach. In passing to the left, the driver is closest to the car he is passing.

B—In turning to the right, the driver if on the right side of the car is able to see how close he is coming to the curb.

C—In drawing up to the curb, the driver is closest to the curb on the right, and therefore can observe how close he is to it. He also can open the tonneau door from this side, while in the left-hand drive arrangement the passengers must open the door themselves, or the driver must climb out to open it for them.

D—In starting the motor, the wheel may be reached, when on the right side, after cranking, to throttle the engine down in the minimum of time, and without going out in the mud.

E—The majority of drivers are accustomed to right-hand driving, and hence would find left-hand drive awkward. These comparisons are illustrated in Figs. 4 and 5.

3—The law only requires that the driver have no one in front of him, and that vehicles shall pass to the right, when proceeding in opposite directions, and that a vehicle in passing another going in the same direction shall pass to the left.

4—The pressure feed system can give no more power than the gravity feed system, provided both are well designed for their purposes. It is used because it insures a positive feed under all conditions and does not require a low carbureter position, nor a high tank.

5—This adjustment tightens or loosens the tension on the low-speed spring of the air valve, thereby giving a richer or leaner mixture.

6—The Hudson 37 is said to develop 37 horsepower at 1,500 revolutions per minute on the brake.

7—No.

8—The Dayton Engineering Laboratories Co., Dayton, O., is the maker of the Delco system.

9—Motor Age is not in a position to make comparisons.

10—In the last stages of the distilla-

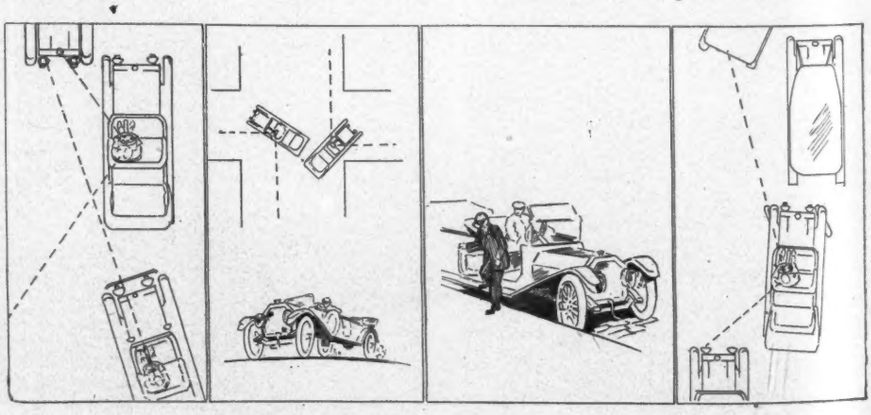


FIG. 2—ILLUSTRATING THE ADVANTAGE OF LEFT-HAND DRIVE

The Readers

Discussion of Relative Advantages of Different Locations of Drive—Thinks Valves Give Power—How Knight is Retimed—Magneto for Ford

Clearing House

Reader Tells How He Prevented Carburerer Freezing in Cold Weather—Cites Experience With Two-Stroke Engine —Duryea Favors Short Stroke

tion of ethyl alcohol, potassium-carbonate, quicklime, or calcium-chlorid are added to the solution to draw off the water, which is otherwise almost impossible to separate from the alcohol. To make alcohol in such a small quantity as 1 gallon would probably be very expensive, varying with the equipment used. In lots of several barrels, however, the cost will vary from 33⅓ cents to 50 cents per gallon. Alcohol has been found to produce, under favorable conditions, about 30 percent more power in a given set of conditions than gasoline in the same conditions.

HORSEPOWER OF VALVE-IN-THE-HEAD

Des Moines, Ia.—Editor Motor Age—I am driving a model 35, 1912 Buick, which has 3¾ by 3¾ cylinders. The motor is the valve-in-the-head type. Why has my car more power than cars with a larger bore and stroke? I have been told that the valve-in-the-head motor had about 10 or 15 per cent more power than motors of the same size.

2—Is there a formula by which one can figure the actual horsepower of the valve-in-the-head motor?

3—Is it true that the S. A. E. stated that the valve-in-the-head motor is the most powerful motor built?

4—Kindly explain in what way the heat affects a valve-in-the-head motor?—P. Kennington.

1—Whether or not your motor has more power or less than other motors of the same bore or stroke, at the same speed, depends more upon the general refinement of design than on the valve location. Of course the valve-in-the-head permits the use of a better shaped combustion chamber, which is claimed by the valve-in-the-head adherents to produce greater power for a given bore and stroke than is possible with other valve arrangements.

2—There is no recognized formula of this nature.

3—No.

4—This question is not clear. If you mean in regard to cooling, this valve location prevents as much water reaching the walls of the combustion chamber as is possible with the other types.

TIMING OF STEARNS-KNIGHT

Middletown, N. Y.—Editor Motor Age—I read your article in Motor Age, October 10, about the Stearns-Knight sleeve-valve motor. I would like to have you let me know how it is timed in case the silent chain should break, and the motor had to be retimed. Would one have to remove the bottom of the crankcase to get at the silent chain on the eccentric shaft? How would you get your port-openings?—M. A. B.

There is no danger of the silent chains used in this motor breaking, as they are capable of transmitting great power, and in this use have very little strain imposed upon them. However, the necessity for retiming is likely to arise with any motor. The crankcase has nothing to do with the timing drive on this motor, as the timing gears and chains are inclosed in an aluminum casing at the front of the motor, which is accessible by the removal of a face plate. To time a Stearns-Knight motor, the chain which drives the eccentric shaft is taken off and the sleeves are brought to a position wherein the exhaust valve ports register, when the piston should be at top dead center. The chains then are replaced, without moving either shaft. The appearance of this drive is shown in Fig. 1.

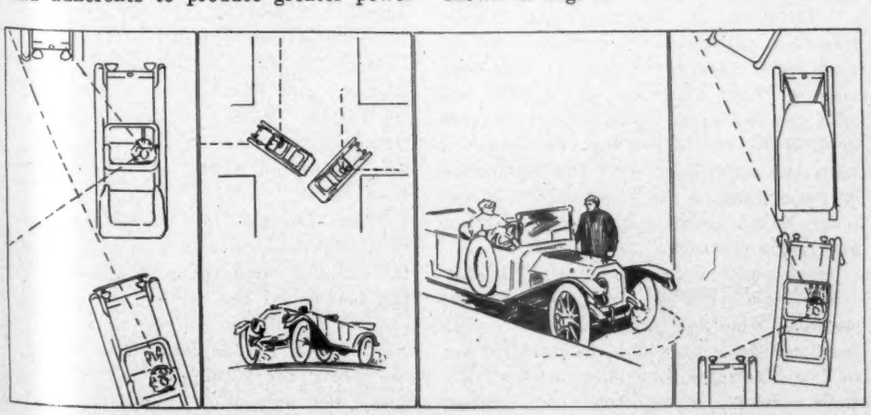
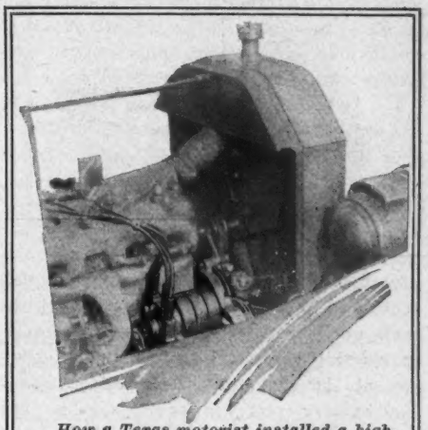


FIG. 3—A FEW DISADVANTAGES OF LEFT LOCATION OF CONTROL

Keeps Carbureter Warm

Motorist Describes Two Practical Methods of Preventing Ice in Mixer



How a Texas motorist installed a high-tension magneto on his Ford car. The magneto gear and cover were especially made and fitted for the purpose

ROCK ISLAND, Ill.—Editor Motor Age—I wish to suggest for the benefit of the many readers of Motor Age a good remedy for carbureter freeze-ups. Nine-tenths of the trouble in starting cars in cold weather is due to freeze-ups in the carbureter. All those who are compelled to use gasoline cars in the winter and who have to leave them standing out in freezing weather for 1 or more hours, will appreciate most any reasonable remedy.

For 5 years the writer has had his share of frozen carbureter troubles. People say that poor gasoline is the cause of the trouble, that the gasoline has water in it. Leave a tank of poor gasoline standing out in the alley when the temperature is 20 degrees below zero and look in it in the morning and see if you can discover any ice in it. You will not find any in the poorest test gasoline. The ice you have the trouble with forms in the gasoline after it leaves the tank in your motor car. It forms around the float in your carbureter, and around the air intake. The ice forms very much as it does on your window panes in the winter time.

I once had a freezeup so complete that we had to remove the tank to the carbureter, and when it was partially thawed out it was held up vertically and an icicle 8 inches long fell out. The ice actually bridged across the supply pipe. Last winter, after my first freeze-up in December, I determined to try a little experiment to avoid this distressing annoyance and I give the remedy here, hoping it will help some poor fellow when he has occasion to leave his car standing for several hours in a freezing atmosphere.

Experiment No. 1—First, I shut off my gasoline at the tank—after throwing off the switch—then opened the petcock in the carbureter and allowed all the gasoline and water in the carbureter and sup-

FIG. 4—SOME POINTS IN PRACTICE IN FAVOR OF RIGHT-HAND DRIVE

ply pipe to run out, then closed the petcock, and left the gasoline shut off at the tank until ready to start the car again. In starting the car I turned on the gasoline at the tank, put the switch plug on the battery and cranked up. The car will start nine times out of ten on the second or third turn, granting that everything is in working order when the car stopped. If it fails to start after cranking a few times prime the cylinders with a little gasoline and it will go. Even if you have a starter on your car and your carbureter is frozen, you will have trouble in starting your car, but this will prevent it.

Experiment No. 2—I found that experiment No. 1 was quite a little trouble, so found an easier way to drain the carbureter. I now shut off the gasoline at the tank while the engine is still running, and allow the engine to suck all of the gasoline out of the carbureter and supply pipe, leave it shut off until ready to start the car, then turn on the gasoline and start up in the usual way. Try it once and be convinced.—E. M. Sala.

LIKES THE TWO-CYCLE

Canton, Mich.—Editor Motor Age—Having noticed the article in Motor Age, dated at Grinnell, Kan., from a reader wanting to hear from those having had experience with the two-cycle engine, I would say first that I have no interest in any type of engine other than as a driver for pleasure and I am not interested in the sale of cars. I am now the owner of my fourth car. Three of them have been the four-cycle type, but early in August of this year I sold my four-cylinder four-cycle car and bought a 30-horse power roadster, weighing 2,600 pounds, of the two-cycle type, with rotary gas distributor, and have now driven the car about 1,200 miles, and for my own satisfaction have given it a pretty thorough tryout, both on heavy sand roads and hills, both steep and hard and sandy. I drove 70 miles from Manton to Kalkaska and return over part of the route selected by Grand Rapids motorists for their reliability run and the pathfinder who passed through here this week speaks of the Manistee river hill as the worst on their tour. This was on the route that I passed over and my car pulled up this hill without a stop, although the car was running under 5 miles an hour for the last 40 feet of the hill. This hill is long and sandy and I should think from 12 to 15 per cent grade.

Part of this road runs through jack pine and scrub oak plains, and there is no laid-out road and of course no grading of hills. Also it is pretty sandy. I made this run without getting out of the car and without boiling the water, and it is a thermo-syphon cooling system without pump. This week a driver of a 40-horsepower four-cycle car told me that he had to make three trials of this Manistee river hill before he got up, and I know of some cars that were unable to make the hill and had to drive around some 30 miles to another bridge.

I find the car pulls steadily and is especially strong on hills and in sand at low speeds. I am well pleased with it on the whole. I find the steady pull of the six-cylinder with its riding qualities at much less expense, both in the purchase price and the cost of operation.

I will try and answer the questions asked. The first one I do not understand just what is meant, but I have run the car 38 miles an hour and it makes this speed without any fuss. I have had no trouble with the engine overheating, even on these hard pulls through sand roads and the quantity of water used is very small. I have had no trouble with carbon and have had no repairs or adjustments of any kind made since I have had the car.

I think the car will run about 2 miles less on a gallon than a four-cycle of the same weight and horsepower. I have been making about 12 miles on a gallon and with my four-cycle I made about 14 miles over about the same kind of roads. I have had no trouble with the lubrication of the engine. I use about a pint of cylinder oil to about 8 gallons of gasoline and put it right into the gasoline.

I have had no trouble starting the car. I have gone out to the garage several mornings when the ground was white with frost and have been able to start the car in 2 or 3 minutes by priming with a little wood alcohol. During the warm weather it was not necessary to prime the motor at all and I have been using a low grade of gasoline, which costs now at retail 18 cents a gallon. I think it starts about the same as the four-cycle. I am not much of a driver for speed as the 38 miles an hour is the fastest I have driven, but I am of the opinion that it is not so fast as the four-cycle engine.

The only fault I can find with the engine is that when standing still it runs unevenly and has a pounding noise which I do not like to hear, but when the car is running this disappears and the engine runs very quietly; in fact, about all that can be heard is the noise made by the vibrator points. In running down grade, when the car goes faster than the engine, we again hear the pounding noise, but this usually can be stopped by a little manipulation of the spark and throttle. I am of the opinion that we will hear more of the two-cycle engine in the future than we have in the past.—J. Edward Jones.

FLAXSEED IN RADIATOR

La Junta, Colo.—Editor Motor Age—The radiator on my Marmon car heats badly. It was leaking some and I put in about a pint or more of flaxseed meal, then ran it for about 10 miles without cylinder oil. It grew very hot and I think baked the meal to the cells and since then I have been troubled with its heating badly. It is a zig-zag type of radiator. Is there anything or any way to remove whatever chokes it up and clean it thoroughly.—A Reader.

The tubes of your radiator are probably badly clogged. The flaxseed meal in all likelihood was hade into a dough in the radiator, and then baked. It is quite likely, too, that this has affected the cylinder jackets and piping, and possibly the pump besides. There are several preparations on the market for the purpose of cleaning out a radiator. Among these are the following: Apex Radiator Cleanser, Banner, Decalcifier, Black Diamond, Field Auto Compound, Radi-No-Leak, Fluff-foe, Colza, Wonder Worker, R. R. R., Nonkoroda, Valvet. These may be purchased of most dealers.

DURYEA DISAGREES

Saginaw, Mich.—Editor Motor Age—The reply to Reader about the long-stroke motor leads me to a criticism of the answer. I believe the long stroke does not give greater expansion. If it did, we engine designers could get any desired economy and efficiency by simply expanding further. Such engines as the Atkinson which had a short suction stroke and a long expansion stroke never would have been built.

There are but 180 degrees to a half revolution and since it is common to open the exhaust valve about 40 degrees before the bottom of the stroke, the expansion stroke cannot be longer than the remainder, or 140 degrees. The length of the stroke has nothing to do with expansion. The number of degrees is the only thing to be considered. A short-stroke

motor can just as easily and as fully expand as a long one.

Look at it another way. We assume that the compression stroke is 180 degrees. Because of lag of the gases and slowness of valve action, it is quite common to open the inlet later and close it later, but we can ignore any slight differences for the present argument. This means that the four-cylinder engine compresses for 180 degrees and expands for 140 degrees. And the negative work of compressing in a long-stroke motor is a disadvantage in the same sense that the long working stroke is said to be an advantage. The crank has to be long for the long stroke so it has not the short powerful leverage for doing the compressing that the short-stroke crank has.

If we could use a short crank for compressing and a long one for working we then would gain some, and this is the effect the salesman tries to produce in the mind of his customer. But it is wrong. The length of crank has very little if anything to do with the problem. If the crank is long the piston moves fast and what is gained in leverage is lost in motion. In other words, it is a manner of gearing. Speed and power are interchanged. The short-stroke motor has a big piston with much power behind it and very slight motion. The long-stroke has the reverse. It is for the engine designer to find the ratio which is best for his needs.

The laws which govern gas engines were laid down fully 50 years ago; long before successful engines were on the market. They are generally admitted. And the engine designer who does not conform to them is going astray. One of them requires that the cylinder walls shall be of the least possible area for the volume of gas used so as to economize the heat of the gas. Another that the expansion shall be as fast as possible so as to use the heat in doing work instead of allowing it to escape into the walls as it will do in a very short time.

The shape which gives least wall surface for any given volume is the spherical one. So our engines should be so designed that they are shorter than spherical when at the compression end of the stroke and longer than spherical when at the point of opening the exhaust. Just what this proportion should be is a question depending on the rate of combustion and many other factors. We may approximate it by assuming the compression space for 60 pounds to be 31 per cent of the stroke, or 1¼ inch in a 4-inch stroke motor. The exhaust may be assumed to open about ¾ inch ahead of bottom. So the total length in which the hot gases are confined will be about 4½ inches. Some designers think that the bore should be this size in order that the spherical shape should be worked up to, as the end of the stroke is approached. It seems to me, however, that the spherical shape should be reached before this point. At mid-position the piston would be 3¼ inches from the head and the bore should be 3¼ inches to afford the spherical shape. Or if we take the mid-length of the distance from the head to the opening of the exhaust we have 2¼ inches as the proper bore. This is properly a long-stroke motor. The other sizes mentioned are not.

But other factors come in for consideration. Rapid expansion is required. Now anybody should see that a small-bore cylinder does not offer the chance for rapid expansion that a large-bore one does, for the cylinder content varies as the square of the bore but only as the length of the stroke. So in order to get rapid expansion of the gases with a small-bore engine we must run the piston at very high speeds, which gives rise to high friction and heating effects that soon get beyond the ability to lubricate. This is why, as Motor Age correctly says, for racing work, the short stroke gives better results.

Then the engine uses must be considered. For stationary work we can determine the speed wanted, figure the piston speed at that speed and make the stroke to suit. The early motors were built with bores and strokes derived in that manner. But experience with motor cars showed that we want most of all flexibility. The flexible engine is the one that can push powerfully at low speeds and run as fast as desired so that we need not be changing gears all the time. The big bore can give the powerful push. The length of the crank does not matter so long as the bearings are such that the push is not eaten up by friction. Very few engine makers will admit that their cranks are so small as to spring or their bearings so poor that they cannot take the push from the small-sized pistons used in motor car practice without losing a lot of power in friction or hurting the bearings.

The long crank requires a long rod to avoid great angularity and side friction on the piston. So engine makers began to work toward shorter strokes and larger bores. And they were quite right. This makes the best motor car. But engines began to get so big that racing authorities had to take notice, so the French decided not to permit larger than certain sensible bores. The maker of racing freaks then began to try to beat his competitor by using long strokes. And long strokes went to an extreme, not to get the best but to get the biggest.

Next in England they began to tax according to horsepower, and they figured the horsepower from the bore only. So the maker cut down the bore and lengthened the stroke. These two things made long strokes and small bores fashionable but never better. Style and not service is doing the rest in this land.

In Europe they are trying to make up for the lack of flexibility by adding more changes of speeds. But the buyer who knows what he needs wants a gas engine that will respond like a steam engine and not speed changes except in emergencies, and there is no question but that the short stroke meets this need best. The short-stroke motor is shorter, lighter for a given power, has smaller crank case, and offers more room in the heads for the valves. In short, it is better in every way except in the matter of theoretical heat losses; and it is unfortunate that buyers and others seem to imagine that in some way it gives greater expansion and more power. If they really want greater expansion they must go to some other means, as for example, the two-cycle engine. There is much misinformation about this type also and few people see that it expands the full length of the compression movement, whereas the four-cycle expands but about fourteen-eighteenths. In short, the compression of a two-cycle does not begin till the exhaust port closes and the expansion ends at the same point on the down stroke. This requires a slightly smaller compression space and results in a very perceptible greater expansion and economy. That many two-cycles have not been economic is due to other and preventable causes, for there is no question about the advantage of the long expansion and the constant compression as well as the small combustion space of the two-cycle.—Charles E. Duryea.

REPAIRS FOR POPE TRIBUNE

Tulsa, Okla.—Editor Motor Age—Please state in the Readers Clearing House where the Pope-Tribune Mfg. Co. is located, or where I can get repair parts.—G. L. S.

The Pope Mfg. Co., Hartford, Conn., maker of the Pope-Hartford car handles the repairs of the Pope-Tribune car.

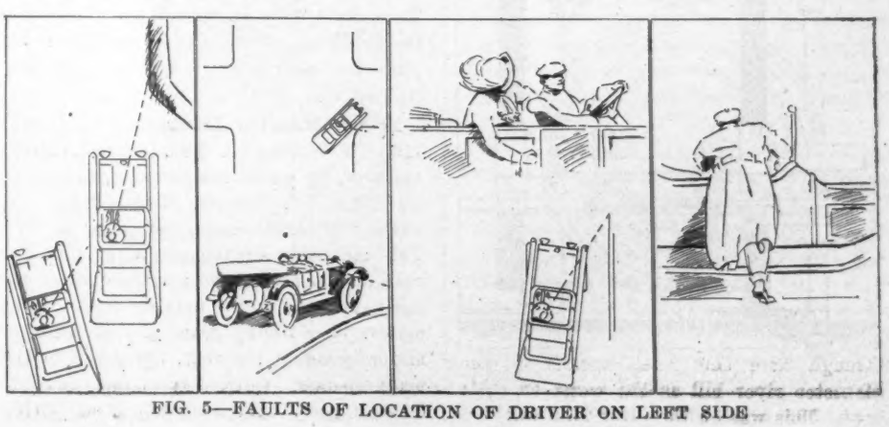


FIG. 5—FAULTS OF LOCATION OF DRIVER ON LEFT SIDE

Current Motor Car Patents

MICHELIN RIM

Michelin Demountable Rim—No. 1,043,714—To Andre Jules Michelin, Paris, France, assignor to Michelin & Co., Clermont-Ferrand, France. Filed May 2, 1911, dated November 5, 1912. Simplicity marks this rim more than any other feature, as it consists of but three pieces. Two of these are felloe segments, hinged at their two adjacent ends to one another, and being linked at their opposite ends to a short segment, which constitutes the remainder of the wheel felloe, and which is adapted to be moved inward, contracting the rim, and permitting the removal of the tire from the wheel.

Combination Motor Car Signal—No. 1,043,704—To Miller Reese Hutchinson, New York. Filed May 4, 1910, dated November 5, 1912. This signal consists of a combination of a reed horn and an electric diaphragm signal. The projector consists of an open-mouthed tapering chamber, closed at one end by the diaphragm, and having an opening into the convolutions of the horn trumpet. The bulb and reed are attached to this in the usual manner, while the electric signal is secured to the back of the diaphragm, immediately behind the horn tubes.

The bulb-horn may be used in the city, while the more penetrating electric horn is available for cross-country work, the double equipment taking no more space than the usual single equipment of either type.

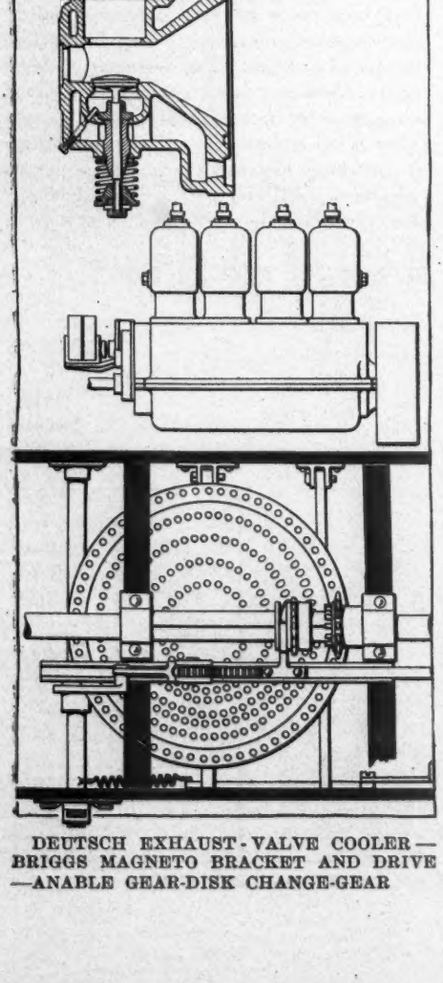
Gear-Change Mechanism—No. 1,043,499—To Warren W. Anable, Grand Rapids, Mich., assignor of one-fourth to Fred Z. Pantlind, Grand Rapids, Mich. Filed February 20, 1911, dated November 5, 1912. Operating on the same plan as the ordinary disk-and-wheel friction drive, but depending upon radically different principles of operation, this arrangement consists of a disk, which is laid across the bed of the vehicle with its axis of rotation vertical, which is provided with a series of perforations in the form of concentric rings. The driving and driven shafts are situated across the face of this disk, longitudinally of the chassis, and revolving independent of each other. The driving shaft is secured to a sprocket pinion, which meshes with the outer series of perforations. The driven shaft is secured to another sprocket pinion, which is adapted to be moved across the face of the disk and engage with the perforations of the disk, the inner ones of which afford low speed, and the outer of which afford high speed. When the driven sprocket is moved adjacent to the driving sprocket, its teeth revolve in a groove in the disk, and a clutch secures it to the driving sprocket, producing direct drive on high gear. The gear is lowered or raised by dropping the disk and moving the movable driven pinion along its shaft, locking it opposite the series of perforations to be engaged with and raising the disk again. This is accomplished by suitable controls. A friction clutch of the ordinary type would have to be fitted.

It is presumed that the gearshift would be controlled by the usual lever, and that the dropping of the disk would be accomplished in conjunction with the clutch control action.

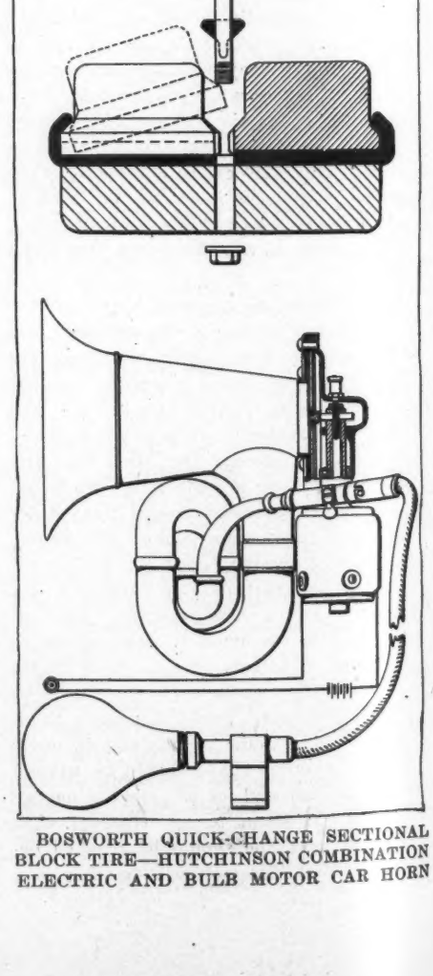
Briggs Magneto Mounting—No. 1,043,116—To William S. Lee, Detroit, Mich., assignor, by mesne assignments, to Briggs-Detroiter Co., Detroit, Mich. Filed November 24, 1911, dated November 5, 1912. This mounting of the magneto is at the rear of the motor, the armature shaft being parallel with the driving shaft of the motor. The timing gears of the Detroiter motor being in the rear, the drive to the magneto gear is direct from the camshaft driving gear. The magneto is supported on a right-angle bracket, which carries the bearing and taper-sleeve. The bearing is held in a disk which is provided with apertures to permit a tool to be inserted for the purpose of positioning the gear.

Exhaust-Valve Cooling Device—No. 1,043,076—To Charles Deutsch, Amiens, France. Filed December 12, 1911, dated November 5, 1912. To cool the exhaust valves of high-powered engines, this patent relates to a spray nozzle situated in the exhaust pocket, beneath the valve, which is adjustable, to admit varying quantities of water to the nozzle, to be sprayed on the valve, cooling it.

Quick-Demountable Block Tire—No. 1,043,061—To Percy B. Bosworth, Akron, O., assignor to the Firestone Tire and Rubber Co., Akron, O. Filed February 6, 1911, dated November 5, 1912. This means of applying block tires consists of a solid rim, adapted to receive two rows of tire sections, and provided with a retaining bead on its outer edges. Retaining clamps are bolted between the two rows, which spread the blocks, and clamp them to the rim. Their removal permits the blocks to be moved inwardly to clear the outer rim bead so that they may be removed.



DEUTSCH EXHAUST-VALVE COOLER—BRIGGS MAGNETO BRACKET AND DRIVE—ANABLE GEAR-DISK CHANGE-GEAR



BOSWORTH QUICK-CHANGE SECTIONAL BLOCK TIRE—HUTCHINSON COMBINATION ELECTRIC AND BULB MOTOR CAR HORN

The Motor Car Repair Shop

Water Ruins Ball Bearings

OWING to complaints from car agents that the ball bearings of the front wheels were too small and not giving the proper service, the engineers of a certain motor car factory, knowing the bearings to be quite large enough and with a generous capacity for overload, made an extensive investigation as to the causes of these troubles. As a result it was learned that the greater number of complaints came in after a spell of rainy weather; also, that there were comparatively few complaints from territories where the weather generally was dry.

This was a fair indication that the trouble was due to the entrance of water into the wheel hubs and onto the balls and ball races; and that the rusting of the bearings, or the cutting of the sand carried in by the water, rendered the bearings unfit for the work to which they were subject. To overcome this the factory is now fitting a more effective felt washer device to keep the oil in and the dirt and water out; and using a more suitable lubricant.

Leaky Gearsets and Axles

There are many motorists having difficulty in keeping their cars or garages clean owing to the fact that oil and grease seem to continually leak from the gearbox and rear-axle casings. Where oil is used, the unwise agent often suggests the use of a hard grease; which in a comparatively short time may be worked up into the recesses of the case where it does no good whatever.

There are many gearsets, of course, which are so designed that grease can be used most advantageously; but where the manufacturer recommends the use of a fluid oil, it should be used. The greater amount of the oil-leaking trouble experienced by motorists, is due to the use of too much oil in the transmission gearbox and rear axle casing. In a gearbox in which a fluid oil is used, the amount of lubricant maintained therein should reach no higher than the lower portion of the lowermost gearshaft; this pertains to gearsets in which the shafts are in either a horizontal or vertical plane. In a gearbox having both the gearshafts in the same horizontal plane, both the shafts will be partly submerged in the oil; and though only the lower shaft of a gearset having the shafts in the same vertical plain will be partly submerged in the lubricant, this shaft and its gears when in motion will throw plenty of oil onto the outer working mechanisms in the case. If too much oil is used, it only tends to work out through the bearings, causing a waste of oil, and dirtying the streets or garage floor wherever the car may stand.

Hints for the Amateur

The same applies to the lubrication of the rear axle, the only difference being that the oil which escapes not only tends to render the brakes ineffective, but often the oil is thrown out onto the wheels, tires and car body, giving them a very dirty appearance, damaging the two latter, and making considerable work for the unfortunate car washer. Should a reduction of the amount of oil used prove ineffective, have new felt washers fitted to the axle ends.

A Handy Motor Stand

In Fig. 1 is shown a type of motor stand employed in the Argyll motor car factory of Scotland; it is constructed of steel and iron throughout and is exceptionally light for so substantial a contrivance. It comprises two shelves, mounted on tubular legs, having rollers or casters at the lower ends to facilitate moving the stand about. While the top shelf, or table portion, is quite large and roomy with raised edges like those of a dish, the lower shelf is smaller and flat, and designed to support the tool box of the workman. The top shelf forms an excellent support for tools in use, and the small parts being operated upon; while the raised edges tend to prevent smaller parts from rolling or being rapidly pushed off therefrom. This stand differs considerably from similar structures now in use, in that it has secured to it a heavy vise which practically converts the stand into a small portable work bench.

Grinding in Valves

About this time of the year, motorists who have been giving their motor cars hard service for the past few months, or since the spring overhauling, may find that the motor is beginning to show a slight loss of power, or that misfiring or a jerky action of the car is noticeable occasionally at low speeds. This may be due to poor compression, caused by ill-seating valves.

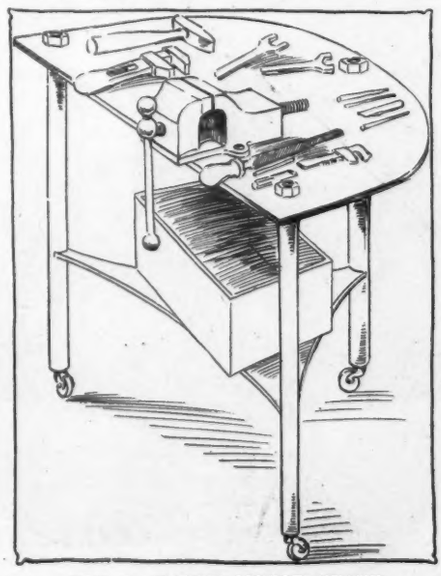


FIG. 1—HANDY MOTOR STAND

To test the compression of a motor, one has but to crank it slowly for several revolutions of the crankshaft, and at the same time carefully feel the compression resistance. If the resistance is comparatively strong and of an elastic or reactive character, it is good; and a fair indication that the valves are seating tightly. It also should be noted, however, that the compression in each cylinder, or the resistance to cranking, is equally great.

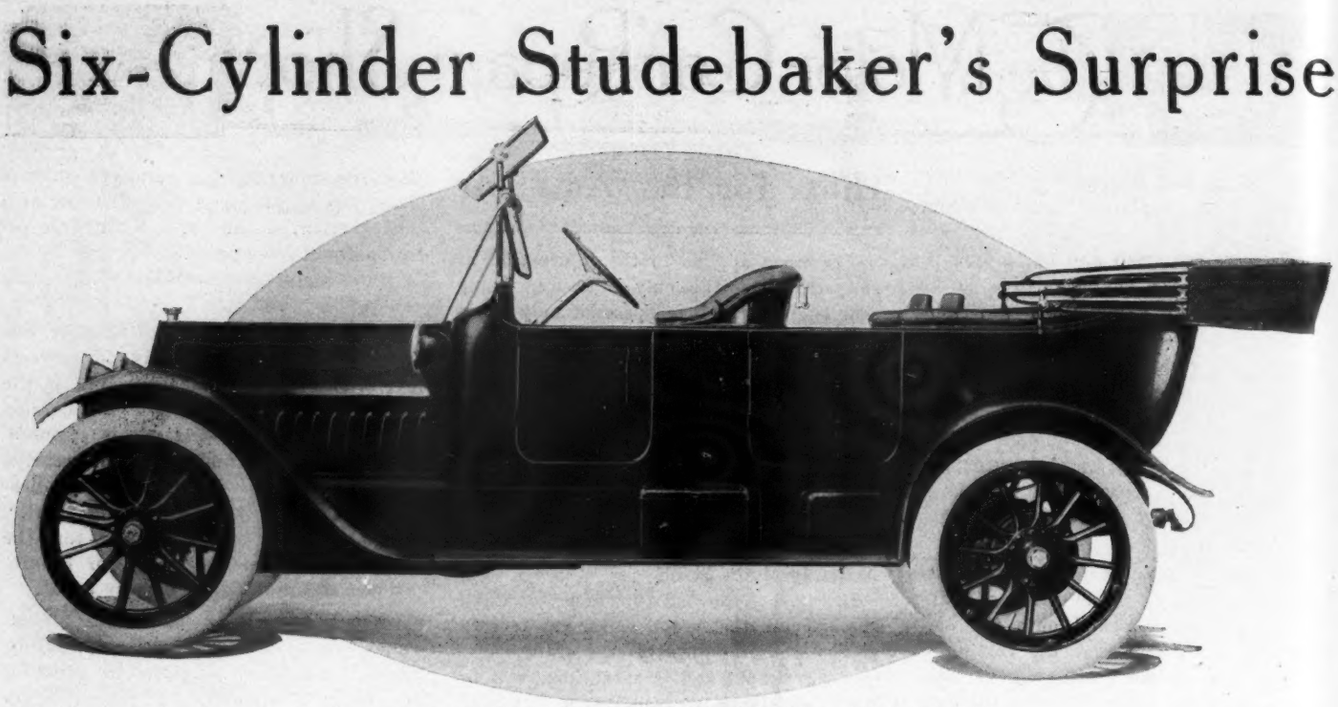
When a loss of compression, accompanied by a consequent loss of power, makes it necessary to reseat or grind in the valves of a motor, the sooner the job is performed the better.

To grind in a valve, first remove it from the motor; if possible block up the entrance between the valve chamber and the cylinder with a cloth having a string tied to it so it can be withdrawn should it fall into the cylinder, then scrape and clean the carbon incrustations off the seats of the valve so that they can be examined. If the valve is badly pitted, it is well to begin the grinding operation with a coarse grade of emery. The emery may be applied in two ways—either a little emery powder and cylinder oil may be mixed into a paste and applied with the finger; or a coat of the cylinder oil may first be applied to the valve seat with the tip of a finger, then the oily finger dipped into the powdered emery and that which adheres to it applied to the oily valve seat.

The grinding operation consists in turning the valve about half a revolution back and forth on its seat in the cylinder by means of the tool in the one hand; and occasionally lifting the valve from its seat and shifting it around with the other hand. The valve should be lifted about ⅛ to ¼-inch every five or six reversals to keep the oil and emery well distributed. The pressure on the tool should be slight. Every few minutes the valve should be removed, the seats cleaned off and examined, and a new solution of emery and oil applied.

When the pits are almost removed, continue the operation with flour of emery instead of the coarser grade; remove the valve oftener, applying more oil and less emery each time, until a good seat is obtained all around; then finish up by polishing the seats with oil. Kerosene is most effectively used in the finishing the seats of a valve, and the higher the polish obtained the less chance there remains for accumulations of carbon.

Six-Cylinder Studebaker's Surprise



STUDEBAKER SIX-CYLINDER MODEL BROUGHT OUT FOR 1913

Besides, This Detroit Concern Offers Four Other Models for 1913—Three of Family of Five Are New on the Market—Four-Cylinder Line a Complete One

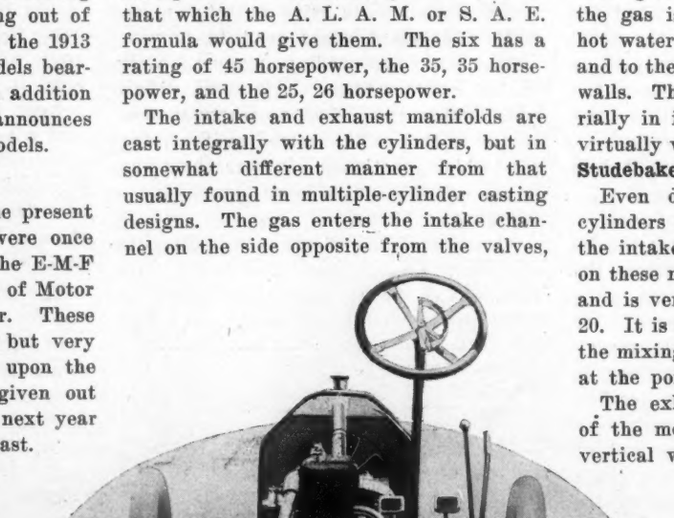
ANOTHER concern has entered the six-cylinder lists—the Studebaker Corporation of Detroit. Not since its inception has this big motor car manufacturing plant been devoted to the turning out of more than two chassis types, but the 1913 season will have five distinct models bearing the Studebaker name, for in addition to its new six the corporation announces a couple of new four-cylinder models.

Little Change in 20 and 30

It will be remembered that the present Studebaker 20 and 30 models were once known as the Flanders 20 and the E-M-F 30, and with these names readers of Motor Age are perhaps most familiar. These two models have been changed but very little since they were first put upon the market and accordingly it is given out that they will be continued for next year practically the same as in the past.

The three new models may be regarded as an entirely new Studebaker series, and while being very similar to one another in mechanical design, they are radically different in many respects from their older brothers. The new motors are all of the same general design, and they are of the L-head, monoblock type, with the valves on the left side. The cylinder dimensions of the six-cylinder engine and of the smaller of the two four-cylinder designs are the same—3½-inch bore and 5-inch stroke. The larger four, model 35 has the same stroke of 5 inches, while the cylinder diameter is 4⅛ inches. On the block, these motors have shown a brake horsepower of considerably in excess of that which the A. L. A. M. or S. A. E. formula would give them. The six has a rating of 45 horsepower, the 35, 35 horsepower, and the 25, 26 horsepower.

The intake and exhaust manifolds are cast integrally with the cylinders, but in somewhat different manner from that usually found in multiple-cylinder casting designs. The gas enters the intake channel on the side opposite from the valves, being led through the casting to the left side and thence to the intake ports of the various cylinders. In passing through the casting to these ports on the opposite side, the gas is somewhat heated, due to the hot water in the adjoining jacket spaces, and to the heat of the neighboring cylinder walls. This heating of the gas aids materially in its vaporization and amounts to virtually water-jacketing the manifold.



FLOATING REAR AXLE ON 35 AND THE SIX

Studebaker Carbureter Retained

Even distribution of the gas to all cylinders is provided for by the form of the intake channels. The carbureter used on these new types is a Studebaker design and is very similar to that used on model 20. It is of the venturi-tube type, that is, the mixing chamber is smallest in diameter at the point where the fuel enters.

The exhaust manifold on the left side of the motor is not flush with the outer vertical wall of the waterjacket, but extends out beyond it, making for exceedingly free exhaust of the waste gases. This design has been carried out in other monoblock types, but not exactly in this way.

The piston faces are not flat, but are crowned. This construction is an aid in reducing carbon deposits. Four rings are fitted to each piston, three above the wrist pin and one below, effectively preventing compression leaks. The drop-forged connecting rods are of the I-section type. Wrist pins are fixed to the connecting rods, the bosses forming the

bearing surfaces of each of the wrist pins.

The crankshaft, also a drop-forging, is carried on three main bearings of the plain babbitt type in the four-cylinder motors. The six crankshaft has four bearings, one between each two cylinders and one at either end, as in usual practice. The camshafts are also similarly mounted in the three engines.

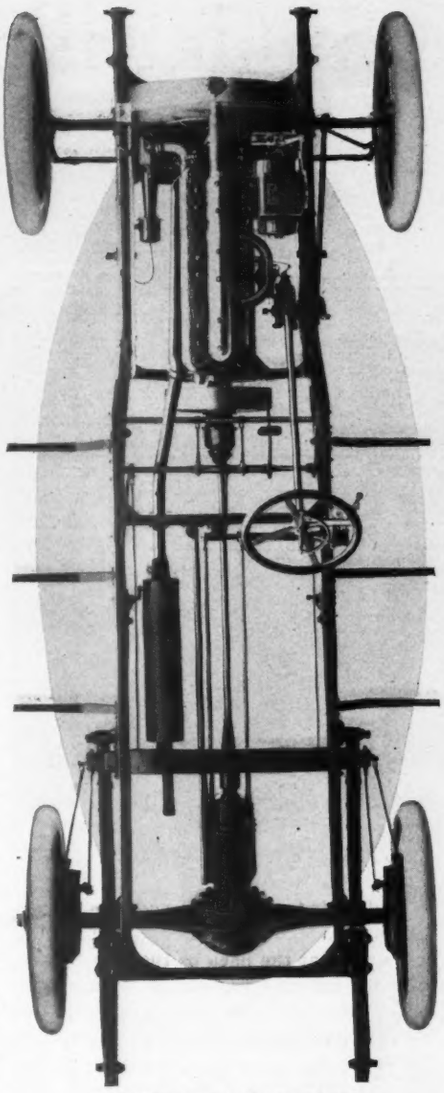
Camshafts have integral cams and oil pump eccentrics for driving the plunger oil pumps. These camshafts are driven from the crankshafts in the usual way by half time gears. These are spirally-cut. All are drop-forgings except the camshaft gears, which are constructed of cast iron. The different material is used to insure silence, since the running of hardened steel against the same material would not be conducive to noiseless operation. The wide faces of the gears and their spiral cut are other factors which aid in this respect.

Stems of the valves are electrically welded to the drop-forged heads. Their lift is ¼ inch. Pushrod guides are of cast iron, and they are pressed into the cylinder castings. Valve springs and rods are completely inclosed by cover plates of pressed steel, which are removed by the taking off of two hand nuts. Valves of the motors of smaller bore are 1 13/16 inches in diameter, while those of the 35 motor have a diameter of 2 5/32 inches. Overall lengths of valves and stems are 6¼ inches and 7 13/16 inches, respectively.

Pump and Magneto Location

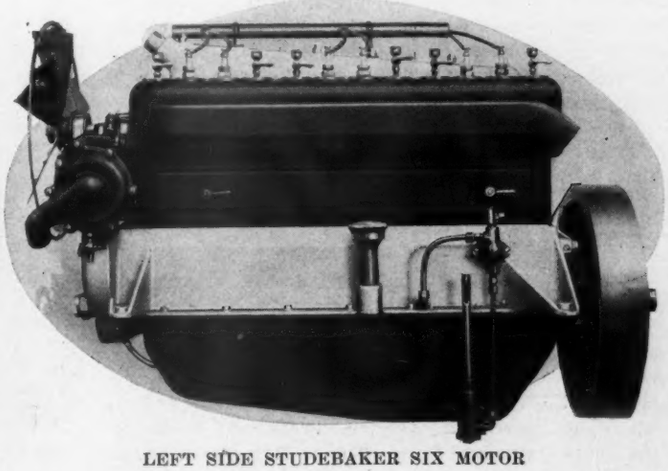
A departure from previous designs of this concern is the location of the pump and magneto in front of the engine on brackets which bolt to the crankcase. Pump and magneto are driven by a transverse shaft, the magneto being mounted at the right end of this shaft and the pump at the left, as seen in the illustrations. The magneto is of Splitdorf make, operating in connection with a dual ignition system. Batteries furnish starting ignition current.

The motors are lubricated by a splash system and a circulating oil pump. The oil is pumped from a reservior at the bottom of the crankcase up through a sight-feed gauge on the dash, and then through a lead to the magneto and pump-shaft gear. It flows down over the timing gears and is eventually directed along the inside of the crankcase wall to the troughs which are in the false bottom of the crankcase. There is one of these troughs under each cylinder, and the lower ends of the connecting rods dip into them as they swing around, splashing the oil onto the various bearings and up into the cylinder walls. The overflow from the troughs and from the bearings finds its way to the reservoir at the extreme bottom of the crankcase, where it is strained before the pump returns it to the sight feed, timing gears and troughs.



STUDEBAKER SIX CHASSIS

The oil reservoir is replenished through the breather pipe located at the left side of the crankcase. Also at the side of the crankcase and extending up from the bottom of the reservoir, is the oil level indicator which shows the amount of lubricant in the reservoir at any time.



LEFT SIDE STUDEBAKER SIX MOTOR

Model 35 and the six are provided with an electric starting and lighting system, which is made exclusively for the Studebaker cars by the Wagner Electric Mfg. Co., St. Louis, Mo., which will furnish the entire starting equipment of Studebaker cars for the 1913 season.

Electric Starter Details

The starter is of the motor-generator type, placed at the right side of the engine at the forward end, and connected with the crankshaft by means of a silent chain. When used for generating current after the gasoline motor has been started, the generator is driven direct from the crankshaft, the gear ratio being 2.65 to 1. But when the electric motor is called upon to start the engine, a set of transmission gears are brought into play which reduce the driving ratio to 13.2 to 1, increasing the electric motor's torque and causing it to turn the crankshaft at a speed of about 80 revolutions a minute. When driven by the engine as a generator, the electrical unit will furnish current at a crankshaft speed as low as 300 revolutions per minute.

A six-cell, nine-plate storage battery having a rated capacity of 60 ampere-hours and a voltage of 12 volts is used in connection with the motor generator. When acting as a generator, the latter furnishes current to this battery, from which the energy is drawn for lighting the lamps and for driving the electrical unit as a motor when required for starting. The battery, when fully charged will furnish sufficient energy to the motor-generator to turn over the crankshaft for several minutes continuously, or it will keep the lights burning for 13 hours.

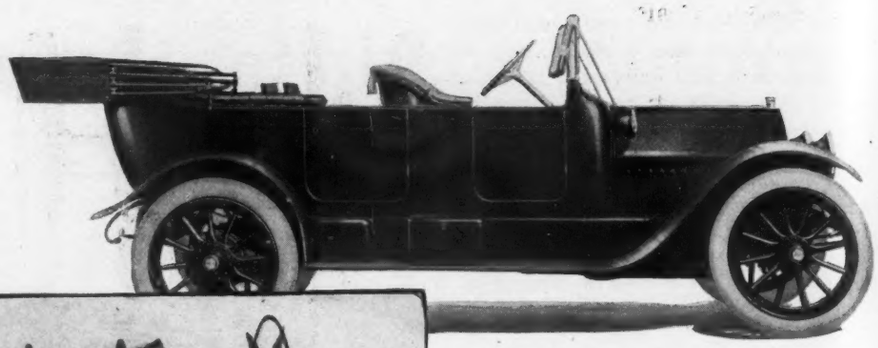
The motor-generator has a self-contained automatic regulating device and by a carefully designed system of field winding and commutation, the current output of the generator is so controlled that it is impossible to overcharge the battery at any time. When the speed has reached 300 revolutions per minute an automatic cut-out mounted under cover on the generator closes the battery circuit. Charging continues until the engine speed drops below 300 revolutions per minute, when the automatic cut-out breaks the circuit again, preventing a discharge of the battery through the generator.

To crank the engine, the driver pulls up on a lever located on the steering column just below the wheel. This shifts a controller drum on the generator to a second position and simultaneously tightens a brake band around the cylinderical gearbox of the apparatus. The controller shift makes the starting connection, and the tightening of the brake band throws into operation the transmission gearing between the motor and the crankshaft,

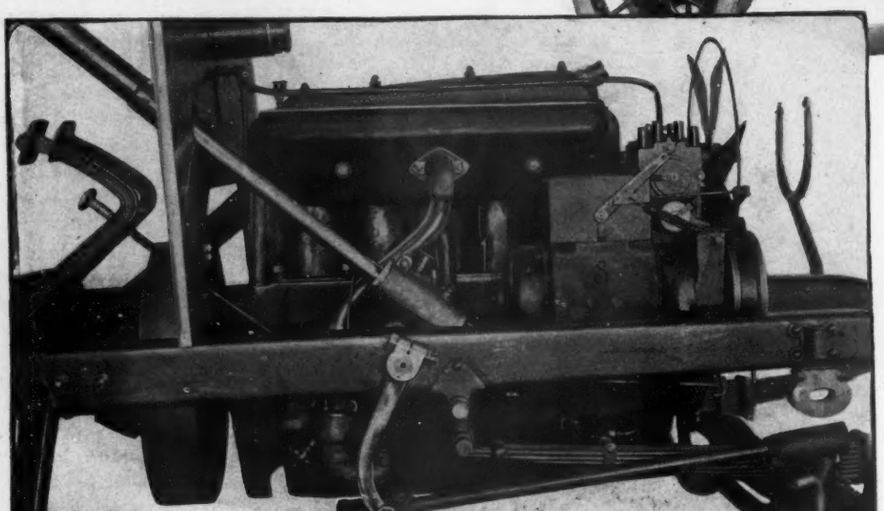
reducing the driving ratio to 13.2 to 1, as already pointed out.

The storage battery is placed on the left running board, while the motor-generator is on the right side. Hence the additional weight of the starting system does not affect the car's balance.

Model 25 has no starter but an acetylene gas primer is installed in place of it as an aid to easy cranking of the motor.



1913 MODEL OF THE STUDEBAKER 35



RIGHT HAND SIDE OF 35 MOTOR, S SHOWING STARTER

This primer allows a certain amount of gas, regulated by a needle valve, to pass into the intake manifold when the motor is cranked.

Except for difference in wheel base the design of the six-cylinder chassis and of model 35 is the same. Some variations from these two are to be found in that of the smaller four-cylinder model. The clutches used on these cars are of the cone type similar to that used on the present model 30. It requires a force of 31 pounds to press down the clutch pedal of model 25, while this engagement of this member on the other two models requires a force of 45 pounds.

The smaller car has its drive shaft enclosed within a torque tube, while in the case of the 35 and the six a stamped steel torque arm runs from a frame cross member back to the gearbox and parallel to the propeller shaft. The drive shafts are properly provided with universal joints, one just back of the clutch and the other at the rear axle.

Details of Studebaker 25

The gearsets are located at the rear axles, the rear cases bolting to the axle housings. The gearsets provide three forward speeds and reverse, operating selectively and being of the sliding gear type.

Model 25 has a semi-floating rear axle, while on the other two a floating type is used. This means that the rear axle shaft is removable through the hub of the wheel by simply removing the hub cap. The differential pinion is placed on the shaft by sliding it to a position over the latter's splined end and fastening with a nut. A cover plate at the back of the axle housing provides for easy inspection of the differential gears and the driving pinion. The direct drive ratio on all models is 3½ to 1.

The emergency brakes are internal expanding, while those for service use contract upon the drums. Brakes on the 35 and six chassis have a diameter of 12 inches and are 2½ inches wide, while on the smaller four they are 9¾ by 2¼ inches.

Frames are narrowed in front to allow for shorter turning radius. Those of the 35 and six have a rear kick-up. The turning radius for the smaller chassis is 16½ feet, while it requires a circle 44 feet in diameter for the larger models. The frames are well braced at three points by cross members, the rear member having gusset plates at its ends to which the ends of the side frame members fasten as well as the springs.

Front springs are half-elliptic on all three models, while those at the rear are full-elliptic on the 25 and three-quarter on the other two. Their dimensions follow:

Model	Length-inches	Width-inches	Type
25	Front..36½	1¾	½-elliptic
	Rear...35½	1¾	elliptic
35 and six	Front..38	2	½-elliptic
	Rear...50	2	¾-elliptic

Right-hand control is found on all models, with brake and clutch pedals, spark and throttle levers, and so on in standard form. The steering gear is of the worm and full gear type, irreversible.

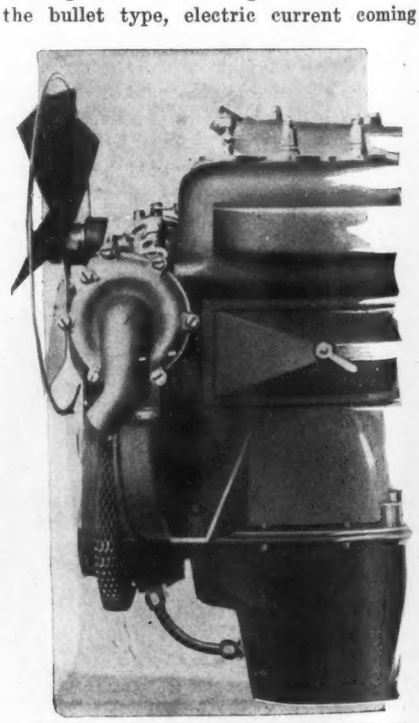
All wheels are of the artillery construction, and on models 35 and six they will be fitted with Booth demountable, quick-detachable rims. The rims of model 25 will not have the demountable feature as standard equipment. The felloes of the wheels are slightly rounded, which feature adds to the general appearance of the wheels.

Studebaker Body Types

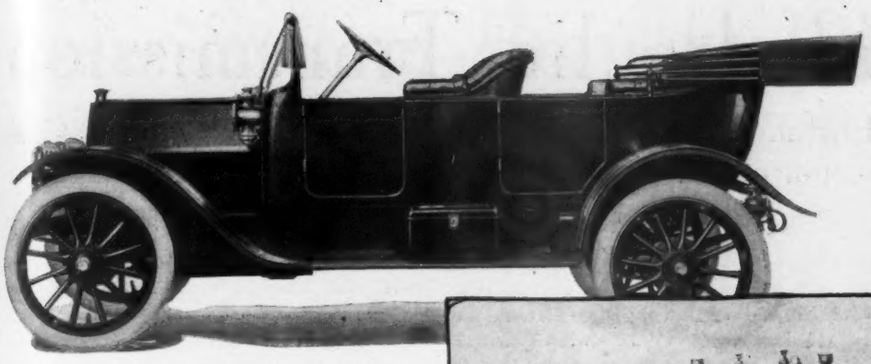
Tires on model 25 are 30 by 3½ inches in size, while on the other models they are 34 by 4 inches. All are of Goodrich quick-detachable make.

The standard model 25 body is a four-passenger type, while the other two machines will carry six. Two seats in the latter are auxiliary and are designed to fold out of the way when not in use. Fenders on the 35 and the six are crowned, which makes a very pleasing effect. Running boards are of wood, linoleum-covered with polished moulding around their edges on these two models, while model 25 is provided with pressed steel running boards.

Lamps on the two larger models are of the bullet type, electric current coming



SILENT CHAIN DRIVE ON CAMSHAFT



1913 MODEL OF THE STUDEBAKER 25

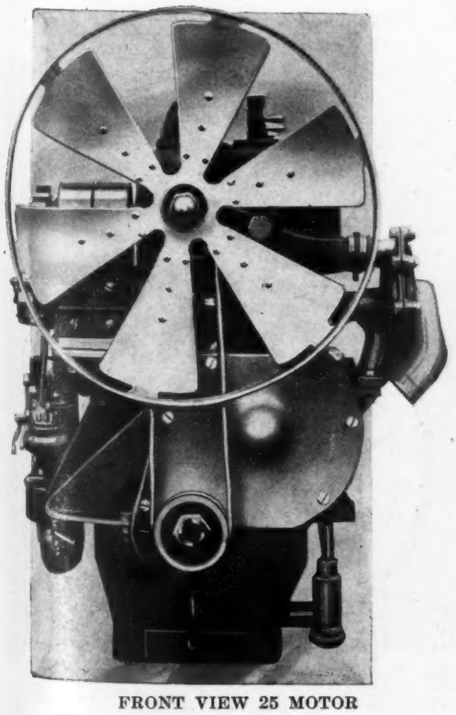
from the storage battery already mentioned. Oil lamps similar to those on model 20 are used on model 25. All models are equipped with Dean electric horns, which are mounted under the hoods. Buttons for operating them are placed on one of the spiders of the steering wheels.

Clean Dashes a Feature

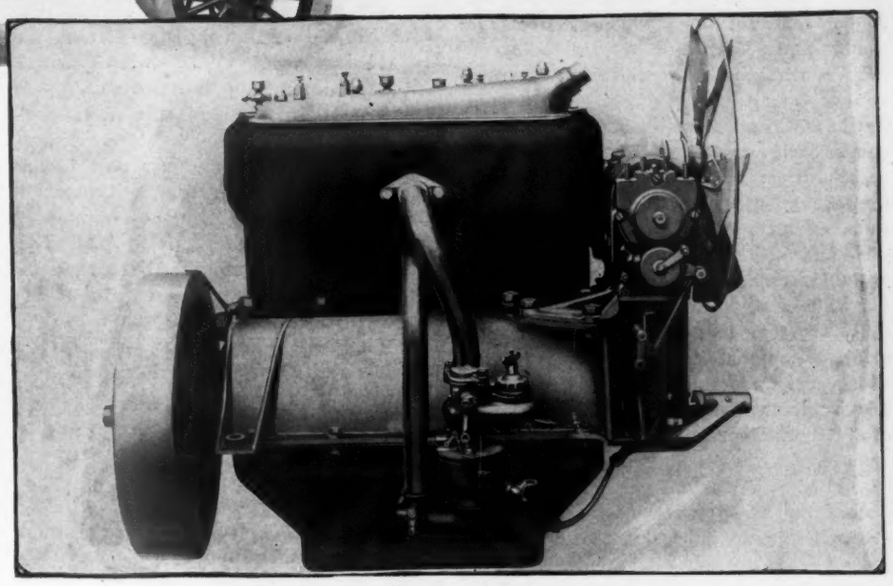
The bodies on all three new models are in line with the latest dictates of motor car fashion, and embody such features as clean running boards, curved backs, low cowl dashes, and so on. A special effort has been made, according to the Studebaker designers, to keep the dashes from appearing cluttered with gauges, switches and the like. The aim has been to make them as simple as possible and at the same time to have them carry everything necessary for the best operation of the car.

While the standard types of bodies are touring styles, three inclosed designs are furnished. On the model 35 chassis, either a coupe or a sedan type may be had, while the six chassis may carry a limousine body.

The wheelbase of the six is 121 inches.



FRONT VIEW 25 MOTOR



RIGHT SIDE OF STUDEBAKER 25 MOTOR

This dimension for the 35 is 116 inches and for the 25, 101 inches. The tread is standard on all and their road clearance is 9½ inches.

Manufacturers' Communications

AKRON, Ohio—Editor Motor Age—The question is often asked why we use a different construction for our electric vehicle tires from that used on gasoline vehicles. The chief reasons are that an electric vehicle, which gets its power from a storage battery, takes a long time to charge when it is run down, frequent recharging and discharging wears out the batteries, and third, the speed of the vehicle is limited, owing to the excessive weight of battery required. This makes it necessary to place more importance upon any item which will increase the life of the expensive battery, increase the number of miles which the car may make on a given charge, and increase the speed of the car for a given amount of current used.

It has been demonstrated that by the use of specially constructed tires, the mileage per battery charge and the speed at which the vehicle may operate may be increased from 20 per cent to 35 per cent over that which is possible with the ordinary gasoline tire.

Our gasoline tires are constructed of a square woven fabric, and during the flexing of the tire, as it goes along the road, considerable power is consumed by the internal friction of the fabric. This power is taken from the engine and is lost. Our electric tires are constructed of cords, and the saving of power which is absorbed by these tires in traction and rolling along the road. That there is some saving is appreciated by nearly every one, but very few realize what a large saving this is, as the above figures will show.

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Our long-distance electric tires are made of hard twisted cords, similar to a fishing line, lying parallel to one another, and thoroughly insulated with rubber, so that they never come in contact with one another, thereby reducing the amount of friction and heat generated. For the best results, absolutely pure rubber is the only thing used, and the only toughening material is put in a strip along the tread of the tire to prevent abrasion, although even a little tread wear is sacrificed to save battery current consumption.

The question might be asked—if this type of tire saves so much electric current, why is it not used on gasoline vehicles more extensively. The answer to this is that this tire will save gasoline, make a gasoline car go faster and increases the easy riding qualities of the car, but these tires will puncture more easily, are more difficult to repair and in the end will not give as low a tire mileage cost as the gasoline type of tire. The tire mileage cost is the principal factor considered in the design of a gasoline tire, but becomes secondary in the case of tires for electric vehicles, owing to the other great savings accomplished by the electric tire.

In our factory we have many pieces of apparatus for testing the relative cost per mile of different types and makes of tires, and we also have a very delicate apparatus for exactly measuring the resiliency and power consumption of tires. Goodyear Tire and Rubber Co., P. W. Litchfield, Factory Manager.

Hele-Shaw Hydraulic Transmission

English Engineers Bring Out Oil Drive Which Affords Control of All Speeds, Braking and Reverse With a Single Control—Pump Is of Radial Revolving Type

WITH claims of extraordinary efficiency, long life and flexibility the hydraulic transmission that has recently been produced by Dr. H. S. Hele-Shaw and his associate, F. Leigh Martineau, has recently been given a trial in London, showing the surprising efficiency of 90 per cent. for the pump portion of the system and 95 per cent. for the motors.

This transmission consists of a five-cylinder pump located directly behind the flywheel which pumps oil into two motors, one in each rear wheel. The pump is connected direct to the engine and the motors are integral with the wheels. Variations of ratio of speed between the engine and drive wheels are effected by a variable stroke arrangement of the piston linkage.

The system is a development of the principle applied to hydraulic capstans, winches and steering gears of ocean vessels by the collaborators. This principle in application consists of a series of radial cylinders with pistons, secured to and revolving with the driving shaft. These pistons are fitted with wrist pins which, instead of being jointed to the usual connecting rod, are pivoted to slippers disposed within an annular guide ring. This guide ring encircles all ot the slippers and runs within a ball bearing.

It is floating and adapted to be moved out of concentricity with the shaft upon which the cylinders are secured and with which they rotate. The effect of thus moving the guide ring is to vary the stroke of the pistons from nil to a certain limit and to reverse the direction of their reciprocation at a given time. All the cylinders communicate at their inner ends with ports disposed within a stationary distributor shaft. This shaft is provided with passages through which the intake and discharge of the fluid which constitutes the operating medium flows.

The action of the pump, Fig. 1, is as follows: D in the figure represents the distributor shaft with passages P1 and P2 for the intake and discharge of the fluid. At the inner portion of each cylinder is a port which registers successively with P1 and P2 on opposite portions of its annular path. To the wrist pins W are pivoted the slippers S; these slippers bear constantly on the inner surface of the guide ring G, which revolves on ball bearings B. This guide ring when in the central position, B of Fig. 1, brings all of the slippers equal distances from their axes so no reciprocation of the pistons is caused by the revolutions of the cylinders. Upon being moved to the right, however, it will be seen that the pistons move outwards when turned to the right and inwards when turned to the left.

The effect of this is to draw the fluid from P1 into the cylinders, discharging it into P2 as they revolve. This is analagous to the action of the transmission pump in forward speed, the guide ring being moved to the left, the direction of fluid flow is reversed, which corresponds to the action of the transmission pump in reversing the vehicle. It will be seen that the stroke of the pistons is governed according to the degree of eccentricity of the guide ring, that is, when moved only a short distance out of center the stroke is short using a large amount of power to produce a slow rate of fluid flow which corresponds to low gearing, in that the small amount of fluid fed to the motors causes them to revolve more slowly, with the engine moving at a given speed, than when the pump-stroke is long. Thus the reduction between the pump or positive element, and the motors, or the negative element, is increased or decreased by the movement of the guide ring; affording reductions of from, say, three to one, to 1,000 to one.

So much for the driving element. The driven elements are two in number, as stated above, one motor being located in each rear wheel. These motors operate on the same principle as the pump, except, of course that the fluid is here used to move the mechanism, instead of the mechanism moving the fluid. The difference in construction between the motors and the pump are that the pump uses a stationary guide-ring, and ball-bearing rollers attached to the wrist-pins instead of the slippers used in the pump; and that the guide ring is elliptical instead of circular. The shape of the guide-ring requires that the rollers be used instead of the slippers, as is apparent. The elliptical form of the guide ring, which is, of course, determined by accurate plotting, and not a true ellipse, causes the pistons to reciprocate twice per revolution, instead of once, as in the pump, thus utilizing twice the amount of fluid that would be used were the ring a circular eccentric. The motors use six cylinders, and four distributor ports. Opposite ports are intercommunicating, the two pairs of ports being separately connected to the two lead pipes. The guide-ring is, of course, stationary, being, in fact, a portion of the motor frame.

Referring to Fig. 2, D is the four-way distributor, W a wrist-pin, with its roller, G the stationary guide-ring, cut in the frame of the motor, P1 and P2 the ports leading to supply pipe S1, and P3 and P4 the ports leading to the supply pipe S2.

The fluid used in the Hele-Shaw system of transmission is oil of ordinary lubricating body, a surplus being stored in a tank. The inlet and outlet connections to the pump are lead by two pipes, one above the other, to a distributing valve of special design which distributes the oil to two pairs of pipes, which lead to the two motors in the rear wheels. This distribu-

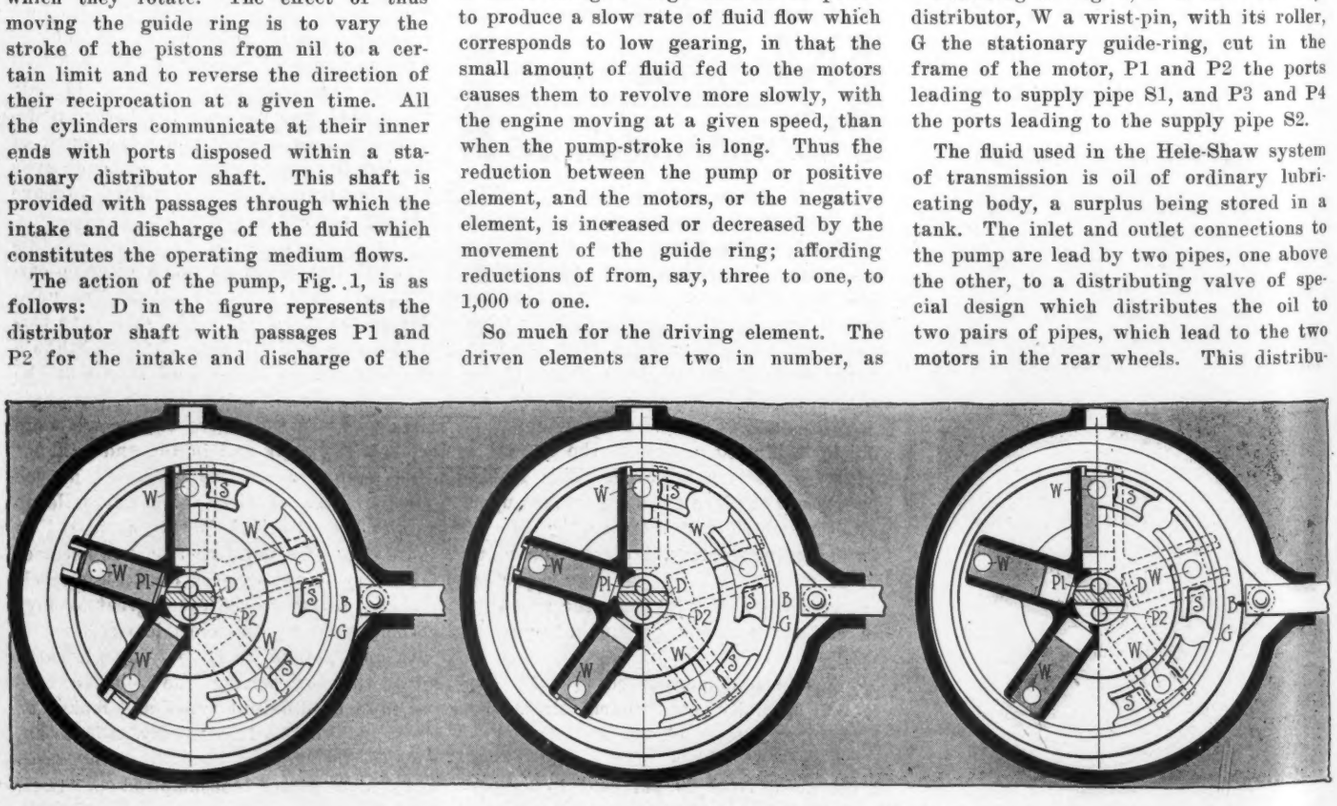


FIG. 1—DIAGRAM OF ACTION OF HELE-SHAW PUMP
A—POSITION FOR FULL SPEED AHEAD. B—POSITION FOR NEUTRAL C—POSITION FOR FULL REVERSE.

New System Brought Out in England

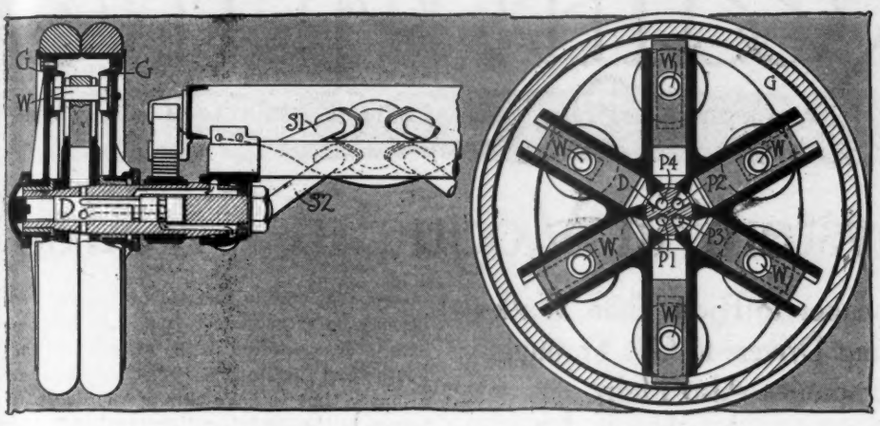


FIG 2—HELE-SHAW PUMP AND DRIVE-WHEEL MEMBER

tor valve is in the nature of a double trunk valve, and permits of universal movement of the pipes as caused by spring deflection. These pipes act as torsion tubes.

The control is by a single pedal, which fulfills all the functions of clutch, change-gear, reverse, and brake controls, by a simple movement of the pump guide-ring. When the pedal is allowed to come all of the way back, full forward speed is obtained, at the minimum speed reduction, or high speed. As it is depressed, the reduction is increased indefinitely until the central position is reached, at which time the guide-ring is concentric with the distributor valve-axle, and the action is neutral. Upon being depressed still more, the guide-ring is thrown out of its concentric position, in the opposite direction from that for forward speed, and the car is driven backward. A suitable stop is fitted, it is understood, to retain the pedal in the neutral position. The braking effect is produced by the depression of the pedal, the effect of a given degree of depression varying with the speed of the vehicle, the weight and gradient, and the motor speed. A shade past neutral will always lock the wheels, when moving forward. This control eliminates the gear lever and the brake pedal, a friction brake being operated by a side lever for emergency and as a standing brake; also being used to lock the pedal in neutral.

All parts are copiously lubricated, the operating medium, with which all members are associated, being itself a lubricant. No churning takes place in the pump, notwithstanding the continual thrust of the shoes, and their rapid rotation. The reason for this is that the guide-ring, while in no wise connected to the slippers, revolves with them, running almost wholly on the ball bearings, by which it is encircled. Thus the only points of actual friction in the pump or in the motors are on the valve axles and the pistons. These parts are all ground to fit, and as there is a very slight seepage of oil at these points, the amount being governed by the pressure, which is proportionate to the speed, they are continually lubricated. There are no packed joints in the entire assembly, what leakage there is through the ground joints being collected in the case of the pump, and pumped from thence to the supply tank by a small auxiliary pump for this purpose.

This system has been demonstrated, as applied to a 3-ton truck chassis, with gratifying results. Pressure gauges were fitted to show the pressures on the suction and compression sides of the pump, and the mechanical efficiency shown for the motor thereby, reached as high as 95 per cent, is the report. The normal pressure shown in ordinary operation was 225 pounds, while the maximum was 600 pounds. It was found to be noiseless, with the exception of a slight pounding of the oil in the motor when the speed was suddenly accelerated or retarded. This defect, however, is now being overcome by the inventor, it is said. The most notable feature of its operation was the smoothness of its action. Starts, stops, and reversals were made smoothly and with a cushioning effect, unlike anything in mechanical transmission.

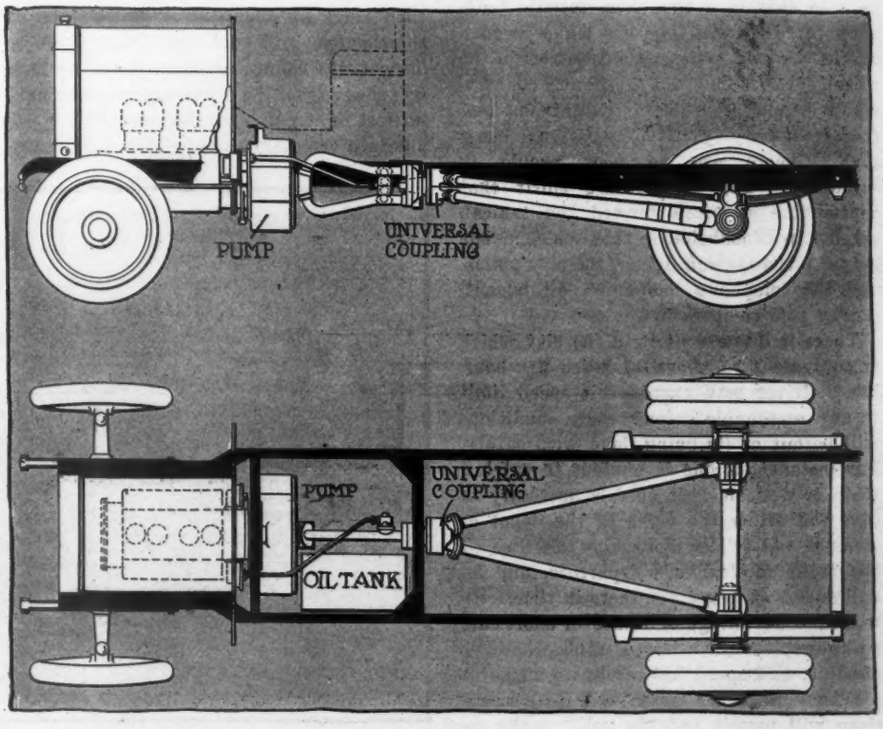


FIG. 3—HELE-SHAW SYSTEM INSTALLED IN A 3-TON TRUCK CHASSIS

THE MOTORISTS' BOOKMAN

An interesting map just come to hand is Bartholomew's orthographical map of the United States and part of Canada, published by Brentano's, New York. Price, 75 cents.

The Minnesota Map Publishing Co., St. Paul, Minn., has recently put out a number of county maps of Minnesota, showing motor roads. The series will be completed in 1913. Each map is bound separately in heavy manila. Price, 25 cents.

Humorous Story

A humorous little motoring story by Raymond Needham is "A Man and a Motor, and Subsequently a Wife." The amateur and the speed-mad play their parts, and it is left somewhat of a question whether the pilot or the piloted in a motor car gets the greatest pleasure out of the trip. The book, fewer than 100 pages, would make excellent reading for one who has an unexpected wait while roadside incidentals in the way of repairs or adjustments are being made by the chauffeur. Bound in paper. Published by St. Clements Publishing Co., London, England.

The Realm of the

Model Taxi System in Vogue in Sweden

Fares So Low It Is Almost Cheaper to Ride Than Walk—Authorities Co-operate in Aiding Drivers to Get Through Traffic—Telephone Companies Also Help

By George W. Gaidzik

ONE of the many excellent conditions that impressed every visitor to the Olympic games at Stockholm, Sweden, last summer, was that of the taxicab service. True, there were hours during the day when the demand for cabs was greater than the supply; but this was due chiefly to the general efficiency of the service. The cars were in such good condition, the rates so reasonable, and they got about so quickly, that every visitor who could get a cab, ordered it the first thing in the morning; used it to go shopping or sight-seeing for 2 or 3 hours before luncheon, and ordered the driver to be back immediately after luncheon to convey a party to the stadium, where the games were held. This service was much enjoyed by the visitors.

Authorities Co-operate

Co-operation is one of the secrets of the taxi service in Stockholm. In fact it might be said that it is the characteristic tendency to co-operate that has made Sweden one of the most prosperous countries in the world, for it is indeed a prosperous country, whose people are rich in contentment and free from poverty. It is a national boast that "There are no poor people in Sweden." The co-operative spirit that contributes so much toward the taxicab service in Stockholm, is that which exists between the taxicab driver, the city police, and the telephone companies, all benefiting by this co-operation.

There is a speed limit in the city which is equivalent to about 15 miles per hour, but a driver may exceed this speed limit to any reasonable extent where conditions will permit of its being done with safety. For instance, if one is anxious to catch a train or a steamer, it only is necessary to give the driver the name of the depot or steamer and tell or show him the time of the train or steamer's departure, and he will endeavor to get you there in time. He will take advantage of whatever short cuts he knows; avoid congested traffic wherever possible, and speed his car up to 25 miles per hour wherever traffic and road conditions will permit and the police make no objections whatsoever.

As for the police, they are regarded with the utmost respect by every driver, and this respect is reciprocated. If a driver is running his car at a high rate of speed the policeman seems to realize that the occupants of his car are in a hurry; if tied up in congested traffic, a sign from the driver generally will secure the aid of the police in getting clear and on his way. It seems that the Swedish police endeavor to expedite rather than regulate the traffic; and facilitate rather than restrain the operations of the motorist, which assistance is greatly appreciated.

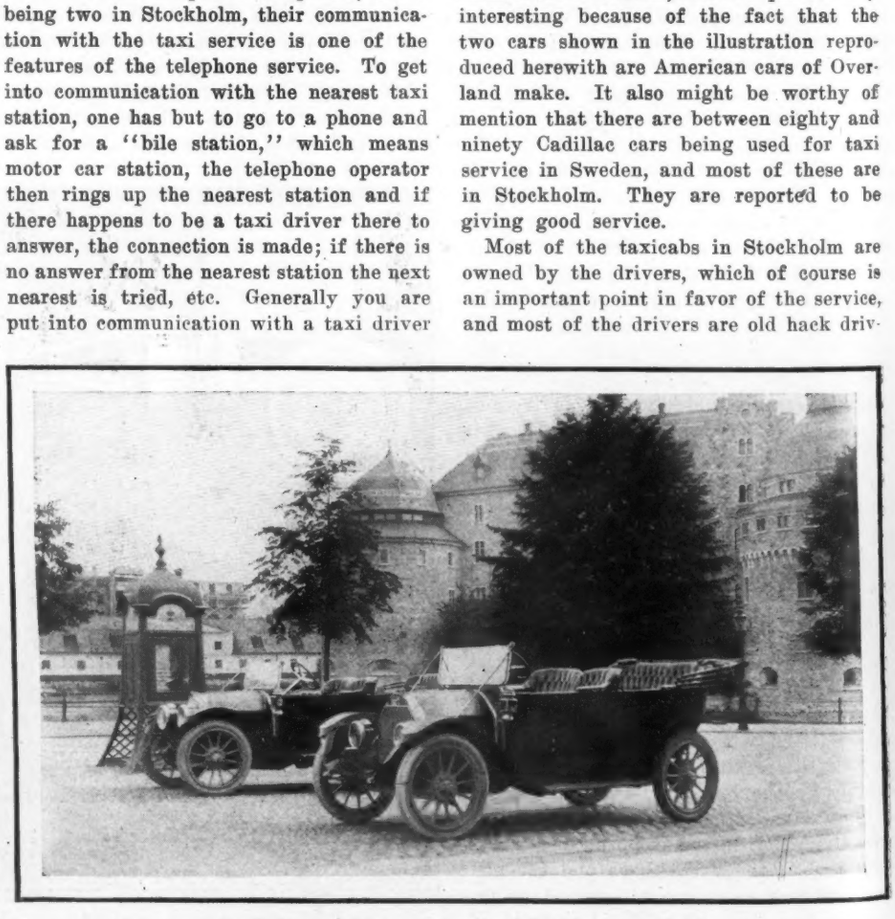
Telephone Service Good

As for the telephone companies, there being two in Stockholm, their communication with the taxi service is one of the features of the telephone service. To get into communication with the nearest taxi station, one has but to go to a phone and ask for a "bile station," which means motor car station, the telephone operator then rings up the nearest station and if there happens to be a taxi driver there to answer, the connection is made; if there is no answer from the nearest station the next nearest is tried, etc. Generally you are put into communication with a taxi driver in less than half a minute; and if desired he may be at your door from 2 to 10 minutes later, according to the distance of the house from the station. Of course it takes a longer time to have cars at the doors of houses in the out-lying districts, but in the city the stations are so well distributed that one has not long to wait before the car arrives.

Convenient Taxicab Stations

A taxi station is not a garage, but simply a space in the street in which the cars are allowed to stand while waiting for a fare. This space generally is arranged near a public telephone. The drivers always are on the alert for phone calls, so a telephone operator has no difficulty in arranging communications between the taxi driver and the public. A characteristic station is located just off the main street of Orebro, a small town in Sweden, and it is particularly interesting because of the fact that the two cars shown in the illustration reproduced herewith are American cars of Overland make. It also might be worthy of mention that there are between eighty and ninety Cadillac cars being used for taxi service in Sweden, and most of these are in Stockholm. They are reported to be giving good service.

Most of the taxicabs in Stockholm are owned by the drivers, which of course is an important point in favor of the service, and most of the drivers are old hack driv-



PUBLIC TAXICAB STAND IN OREBRO, SWEDEN

Commercial Car

Motor Delivery Sentiment Changing

Conviction Growing That Power Vehicle Service Has Demonstrated Its Practicability—Increased Cost of Horse System Forcing Many Business Men to Switch

By William B. Stout

THERE is a changing sentiment toward the use of motor trucks on the part of both user, driver and customer. Firms using horsed systems, through the increased cost and lessening possibilities of their form of delivery are becoming interested in motors.

The conviction on the part of some that the motor truck was an experiment is giving place to a belief in the power wagon as the eventual delivery unit. Drivers hostile to motor trucks are either becoming educated to the level of the new delivery and are changing their feeling toward it or in increasing numbers are being eliminated from their former routes and lines of hauling.

Now Welcome Motor Delivery

Housewives who looked with pride at the first motor delivery vehicle stopping at their doors, and watched it with interest through the curtains of the front parlor as it rolled away, interested in it only as a novelty and advertisement, are now taking the motor vehicle seriously, appreciating its better service, the more courteous drivers, and the economy of goods delivered with decreased breakage and delay by motor wagons.

Merchants receiving goods at their delivery platforms from motor trucks, appreciating the cost of idle time through their own experience with their own trucks at other delivery platforms, are giving motors preference in unloading and doing all that they can to get them away as soon as possible. This new sentiment is making motor trucks pay in lines where horses were favored before.

A new spirit has entered delivery all around wherever motor vehicles are coming into use in large numbers. It is very near to a new feeling of self-respect on the part of many firms over having gotten into a cleaner and better field after a long period at a lower level of efficiency and cleanliness. As fast as motor trucks increase so will this feeling grow in increasing ratio, until suddenly every firm will demand motors for their deliveries and delivery.

One of the first factors toward the changing sentiment is the increased and increasing cost of horse delivery. Within the last 10 years, according to official government figures, the price of horses has increased 137 per cent while the number of animals has increased but 13 per cent.

Overhead Expense Increasing

During the same period the price of hay has gone up more than 100 per cent. Rents are higher than formerly by 100 per cent in our large cities, and as a result there is more mileage of unproductive hauling to and from the more distant barns both mornings and evenings. Repair work is increasing in cost every year, wages are increasing and altogether the cost of horse delivery is becoming alarmingly high.

This very fact has caused business men to look about for a cheaper way of distributing goods. With horses they are limited to a 15-mile-a-day service for each vehicle. Wagon and driver are idle over half of the day waiting on the horse. Where can he get a vehicle that will not tire?

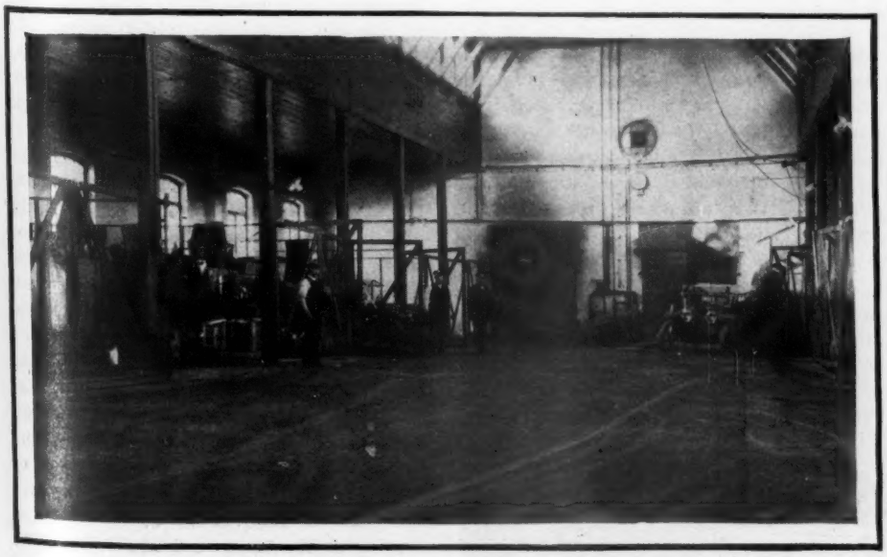
When the motor truck first appeared

ers who have given up their horse power for motor power, thus keeping abreast of the times.

There are a few owners, however, who have a number of cars; some have two, some four or five; and one to two concerns have ten or twelve cars in service. In an accompanying illustration is shown a view of the garage of one of the largest of these latter concerns. As one enters this garage, a small office is found at the right; and partitioned off on the left are the wash racks. Behind these on either side are arranged the stalls in which the drivers keep their cars. Each of these stalls is partitioned off at either side by a wire screen of coarse mesh, and provided with doors of similar construction at the front, which are secured by padlocks in the absence of the driver.

The wire screen enclosures have the advantage of keeping out trespassers but admitting much light for the convenience of the drivers when they are required to inspect, oil or adjust the mechanisms of their machines. Convenient sockets also are provided for electric light connections; and readily accessible water and air piping is installed about the garage for respectively filling radiators and inflating tires.

The garages are conducted in a most systematic manner and one can pick up many hints that are of value to garagemen in America.



INTERIOR OF TAXICAB GARAGE IN STOCKHOLM, SWEDEN

many men at once took on the new vehicle and put it to work. Many were surprised to find that they could not make them pay and discontinued the motor in disgust. These are now waking up again to the fact that the truck was not to blame formerly but the delivery conditions at the time. As these have changed very materially even in the last few months in the big cities through the influence of the many trucks now running, they see a chance to make good on their former experience.

Lost Time at Freight Depots

Take the freight depots, for instance. These are in many cities the worst offenders in the matter of lost time. Motor vehicles have had to wait from 40 minutes to 2 hours before they could get unloaded at the congested platforms of our city freight depots. Not long since the writer saw in Minneapolis a line of eight wagons waiting to unload at a freight platform with a motor truck the last in the line. A few days later a similar line was noted at a Chicago platform. At the end of the line was a 3-ton motor truck, the driver sitting astride of the hood of the car smoking and waiting, as he leaned back against the windshield as a back rest. The wait did not seem to chafe him any as he was used to horse-pace unloading methods—and anyway what would be the use in his trying to hurry? The other drivers would only laugh at him.

Conditions are changing at these stations, however. As motor trucks come increasingly to the platforms and make these long waits shipping clerks are finding out the delays. They are making complaints to the railroads and these roads, aiming to draw custom to their lines, are arranging with the larger shippers to give their machines preference.

Delays Are Explained

The driver of a certain Chicago motor truck of large tonnage which makes frequent trips to one of the freight yards was asked recently about the delays at these points.

"We don't have any trouble," he answered, "we've got things fixed down there so that when we come in we get a door right away. If we can't get a door right away they load us outside. You see we ship a lot of stuff over their road and they want our trade. If they can't fix it so we can get our load quickly and get away quickly, why we'll ship over the X and Q. They'll fix it for us quick enough."

This truck hauls six 3-ton loads a day from this station as against three smaller loads formerly done by horses.

All of this is going to affect the small shipper eventually, for as soon as the railways realize what a magnet for business the installing of a quick unloading and loading business arrangement at shipping points would be, they will install such a system. If the A road can unload a truck and send it away with a load in 20 minutes from the time it arrives while the B road keeps a truck waiting 2 hours before it can get away, it is easy to understand that the truck owner will ship over A road whenever it is possible and steer clear of B freight platform whenever he can.

As motor truck use is increasing at an enormous rate the influence brought to bear on those responsible for these congested delivery points is building up a new feeling of these men toward the truck as a possibility instead of a nuisance.

In Chicago the demands have become so insistent that a special meeting of those hauling to these points has been called by the traffic department of the city for a discussion and the development of ways and means for bettering conditions. Chicago officials favor the motor vehicle as one of the solutions of traffic congestion downtown and with their influence together with that of users and owners of motor vehicles the new sentiment will soon take tangible shape.

Drivers as well are acquiring a new feeling toward motor trucks, with some a favorable one, with others unfavorable.

Talking with a Chicago driver for a coal company recently the attitude of drivers of his class was well explained. During the talk the smell of cheap whiskey was the predominating feature. The man himself was the result of horse-pace methods of living.

Attitude of Drivers

The occasion was one where the coal wagon with three horses was held up by a narrow alley and an exceptionally inconvenient coal hole. After waiting 1½ hour at the entrance to the alley the wagon finally got in only to find the coal hole covered by the wheel of a wagon delivering water to a large office building. On inquiry the driver found that it would be at least an hour before this wagon left. There was no one on the wagon and no place to take it to, so that there was nothing to do but wait—an example of some of the delivery conditions met with by coal wagons in Chicago.

Texans Find in Motor Car

Real Estate Men Maintain Fleets for Use of Their Customers

By W. D. Hornaday

MORE than fifty motor cars were employed 1 day recently in transporting prospective land buyers over a large ranch tract in south Texas that is being opened for settlement.

The use of motor cars in the sparsely settled portions of the country is doing more perhaps to bring about the colonization of ranch lands by farmers than any other one factor. In the days before this modern vehicle came into use it was impracticable to convey land prospectors to properties situated many miles from the railroad, and as a result of that condition the farm development had its beginning close to the railways. It is now possible, by the use of motor cars, to convey prospective settlers anywhere from 10 to 50 miles from railway points and back again within a few hours.

All of the larger land selling agencies now keep in constant service anywhere from one-half dozen to as many as twenty-five motor cars for the special purpose of handling the crowds of land prospectors that desire to be shown over the properties. In case of an unusually large number of prospective buyers arriving on the same day the land men press into service extra motor cars which are loaned them by their neighbors. It was on such a day as this that the colonizers of a large tract or ranch land in the lower gulf coast region of the state recently found it necessary to provide cars for nearly 200 homeseekers.

The roads in nearly all the ranch region of the state are exceptionally good. While little work has been done upon many of them, they naturally are in fine shape except in periods of rainy weather. So important has the use of motor cars become in the country districts of Texas that one of the first improvements that is made by many of the colonization people when they prepare a tract of land for settlement is the construction of good highways through all portions of it. One of these concerns that is rapidly converting a ranch of about 100,000 acres into farming tracts has constructed more than 500 miles of good roads through the property. These roads are not only used to advantage in showing the land to prospective purchasers but they are of great benefit to the new settlers themselves.

Many of the men who are establishing themselves in these new homes are comfortably well off in worldly possessions and nearly all of them own one or more motor cars. They are a different type of immigrants from the element that invaded the west in the earlier days. There is nothing of the boom type about them. In most cases they are the sons of well to

Its location was such that the load could not be gotten off from the tailboard or the side chutes of the coal wagon, requiring that it be shoveled off by hand over the rear wheel, from the best position that the wagon could eventually take.

The driver waited, and while he waited discussed the coming of the motor truck.

"We fellows," said he, "are getting the worst of it from these motor wagons. You see, we are paid by the load. Now I get $1.17 for delivering this load and see how I'm held up. How many loads like this could I deliver in a day? Not many. And yet the company doesn't make any difference.

Teamsters Losing Money

"We used to get a lot of good hauls, easy places to unload and only a few of this kind. Now the trucks get all the good ones and we get stuff like this. It only means that we can't make as many trips and don't get the money we used to. The motor trucks are coming all right, I guess, but they are hurting us fellows right now."

"You see, when we load we get it, too," he continued, "for when a motor truck comes in the coal yard they let it go ahead and we have to wait. You see we get it at both ends."

He was asked if he wouldn't like to run a motor vehicle.

"Well, I was offered one last year," he answered, "but I thought I'd stick to my team. I've got some pretty fine horses there."

There is this side to be considered and yet nearly all of these drivers who wish it and work for it will have a chance to drive trucks at better wages. The ones who don't want to advance and who hold to the old through sentiment will suffer for it as the shoe manufacturer of England told of recently by a friend. This man, a wealthy uncle of the man telling the story, had been engaged in the shoe manufacturing business for many years in England and had made a small fortune at it. All his product was advertised as real hand-made. With the advent of shoe-making machinery the old gentleman refused to be influenced by their coming, sticking to the old things, and making his advertised hand-made shoes in spite of popular demand until he lost his whole fortune.

There are many drivers and horse users who on a smaller scale are going to go through this same experience. If they do not join in with the change of sentiment, take up the motor vehicle for what it is worth, grow and develop out of horse-pace methods and come to a higher level, they will be eliminated in the process.

The third branch which has been moved to a change of sentiment is the receiver of the delivery.

At first the motor truck was looked upon as a luxury indulged in by the buyer as an advertisement. It cost so much more than horses, how could it be other than extra money and an increased cost? For this the consumer had to pay.

The housewife took some pride in having the new vehicles stop at her door, and was willing to pay a trifle more for her groceries if they were delivered by a smart electric, but the business man who had the goods coming to his store in trucks thought differently.

When R. R. Anderson bought a motor truck for his commission business on South Water street in Chicago, one of his prominent customers took objection to it on the ground that the machine which cost $2,000 to $3,000 was bought out of profits from him, and that if he, Mr. Anderson, could afford to buy motor trucks at $3,000 he could afford as well to shave his profits a little to his customers' advantage. The customer felt that his own good money had been spent for the new truck.

Truck Economy Demonstrated

However, this feeling is now far from general, for the economy of the motor vehicle is becoming better known every day and a firm which buys motor vehicles nowadays is not thought of as extravagant but as thrifty and up to date. The customer who receives his perishable goods in winter without its freezing on the way, or who gets his load of coal on schedule on a stormy winter's day when horses work at their worst, or who, living 6 or 8 miles from the city's center, receives his delivery of a package within an hour or two after his order was given, feels that the truck is a success and looks for its coming in other lines which it has not entered as yet where he feels better service is needed.

Truly the sentiment toward motor trucks is changing rapidly. There has been more ery of a package within an hour or so than 100 per cent of increase in the number of motor trucks in our cities within the last year. Each truck put into use freight and goods handling which make for more speed and efficiency. As this efficiency increases at new points new lines can take up the truck and make it pay, so that coming in cumulative numbers a few years hence should see the unsanitary and wasteful horse abolished from cities.

a Vehicle for All Needs

Ranchmen Now Able to Live in Town Because of Owning Power Machines

do farmers of middle western states who have gone to Texas for the purpose of reaping the benefits of obtaining land at low prices, with the assurance that it will increase rapidly in value and that it is capable of producing profitable crops of various kinds.

It is in what is known as the plains country of Texas, which embraces all of the panhandle region, that the motor car is put to probably its greatest practical use by land owners, not only by the farmers but the ranchmen. Nearly every man in that part of Texas owns a motor car. Through their every day use they have wrought a transformation in the method of conducting the stock-raising and agricultural industry. Instead of living in little shacks on their ranches as formerly most of the big land owners now have their own comfortable homes in town and make daily trips to and from their ranches. It enables the people to carry on their business with far greater dispatch than the old way of living.

The ranchman keeps in close daily touch with the markets and the affairs of the outside world through his residence in town and at the same time is just as closely associated with his work upon the range as when he lived there. The cars are used quite generally during the round-up season, not in actually rounding up the cattle but in transporting the owners and cowboys from place to place upon the ranches and carrying in supplies and for a variety of other practical purposes. Farmers in the plains country use the motor car to carry to market butter, eggs and vegetables and to haul home groceries and supplies at a great saving of time and labor.

Another important result which comes from the use of motor cars in the region of magnificent distances all through the southwest and west is the creation of a more social spirit and friendliness on the part of the inhabitants towards each other. It is now possible for families to visit their distant neighbors at frequent intervals. It is not uncommon for young people to ride 70 to 75 miles across the plains in a motor car to attend a dance or some other social gathering and return home the same night. The social sphere of the community has been vastly widened by the use of this conveyance in the Lone Star state.

Chasing coyotes in motor cars is a favorite amusement in the plains region. This sport can only be carried on in large pastures where there are no wire fences to interfere with the chase. It is comparatively easy to run down a coyote in a motor car. The animals are short-winded and can keep up the speed for only a few miles.

From the

To Test Street Car Law—The Columbus Automobile Club, Columbus, O., has employed Attorney C. D. Saviers to test the constitutionality of the recent ordinance enacted by the city council compelling all motor cars to come to a full stop while passing a street car discharging passengers. It is believed the ordinance will be held unconstitutional on a number of different grounds.

Encouraging the Farmers—Prizes to the amount of $600 will be given to farmers south of Milan, Ill., who place the roads in their vicinity in the best condition by dragging and drainage. Each competitor must submit 1 mile of road as his share in the competition. It is believed that the offer will prove a strong incentive to all farmers to give the highways in front of their farms the best possible attention and thus keep them in good condition all through the year. The prizes are offered by the business men of Rock Island.

Oiled Roads Preferred—After a great deal of experimenting most engineers here paying attention to road construction are of the opinion that the California system of oiled roads is best for most sections of Louisiana. The average cost in the southern part of the state is $6,000 a mile. In northern Louisiana, nearer the oil supply, the cost is somewhat less. Only short stretches of this kind of road have been constructed for testing purposes, but considerable regular construction is now in progress in Iberia parish. Acadia parish soon will vote on a bond issue of $200,000 to be spent for petrolithic roads.

Demand Municipal Garage—A municipal garage may be the outcome of the Birmingham, Ala., controversy in regard to parking cars along the curbs. A convenient site for a municipal garage is available and many are in favor of an ordinance which will prohibit cars from being allowed to stand at the curb in the business district but which will make it necessary for the city to provide a proper place for cars to stand. A fund subscribed among the owners will be provided to pay salaries of several chauffeurs who will be ready at all times to deliver a car at any point from which a call comes in. The idea is meeting with considerable favor.

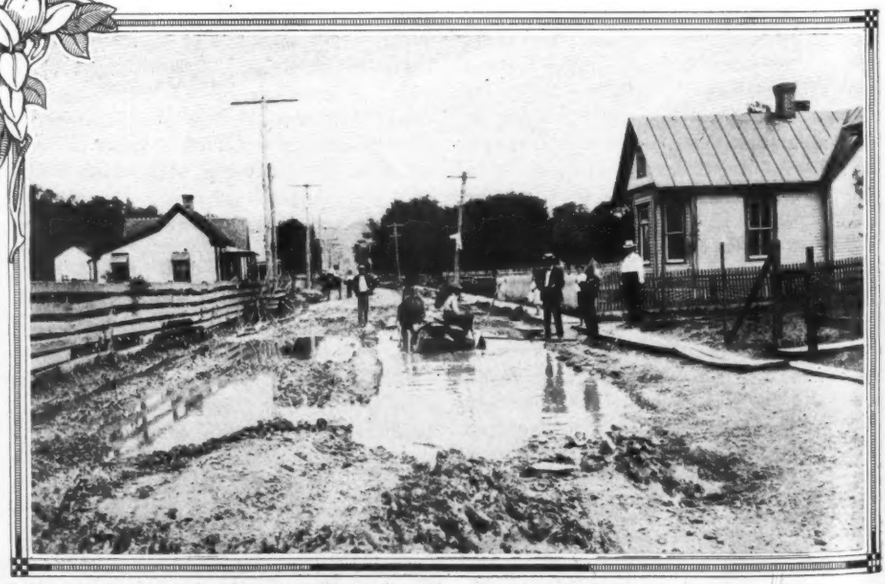
Holds Dog Responsible—The Massachusetts supreme court has handed down a decision that Oren W. Williams, a motorist, of Templeton, Mass., has grounds for an action to recover damages because a dog snapped at his motor car, causing an accident. Mr. Williams on September 15, 1910, was running his motor car through South Lincoln when a dog weighing 133 pounds, and belonging to Joseph P. Brennan, of that town, ran barking beside the machine and snapped at the tires. Williams at the time was trying to avoid an ice wagon. The dog struck the left forward wheel of the car, causing it to skid into the horse of the ice wagon. The horse reared and descended on top of the motor car. As a result of this Williams brought suit against Brennan and secured a verdict from a jury trial. Brennan appealed to the full bench of the supreme court and the latter now orders that Williams was right in his contention that the dog was responsible, and the verdict is ordered to stand. Lawyers received the decision with interest.

OMAHA WOMAN EQUIPS CAR WITH FENDER

Keeping Open All Winter—The Milwaukee Automobile Club has decided to keep its semi-country club house on the Blue Mound road, 4 miles west of the city, open throughout the coming winter, being one of the first clubs of this kind in this zone to make the experiment. Last year the club house was closed on December 15 and not reopened until April 1. However, it was found that the expense of closing and reopening, deterioration and effects of weather are practically equal to the expense of keeping the house open without patronage. The demands of members that there be no interruption, too, caused the board of directors to take action toward keeping the house open. A series of novel winter entertainments is planned.

Ohio's Big Map—The Ohio state highway commission at Columbus is just completing a large map which is nearly 10 feet square and which shows the system of intercounty highways as contemplated by the commission. The map, which required several months of careful work, was made possible through the assistance of every county engineer in the state. Every road is shown and the relative value of the road is noted. This is deter-

Some Road Contrasts



THE accompanying illustration shows a road at Paintsville, Ky., where the need of improved highways evidently has not been impressed upon the natives. The photograph is taken from the files of the department of public roads at Washington and is held out as an object lesson for the good roads enthusiasts

Four Winds

MAXWELL USED IN MONTANA MAIL SERVICE

mined by the amount of traffic over it and the territory it covers. The map shows about 89,000 miles of roads in the state and the intercounty system about 10 per cent of the roads. Over this one-tenth of the highways 90 per cent of the traffic of the state goes.

Using Fender on Car—A woman is the first citizen of Omaha, Neb., to use an automatic fender on her motor car. Mrs. Joseph Weeth, 1917 Wirt street, a member of the Omaha Woman's Club, vice-regent of the Daughters of the American Revolution, member of the Omaha Woman's Democratic League and prominent church worker, has put on her car an automatic fender which is a net device that when closed looks like the ordinary bumper. It can be released in a second by placing the foot on a release, quickly reached, and when opened spreads out before the car in such a manner as to cover the entire front of the car. An ordinance was placed before the Omaha commission requiring the use of fenders on all motor cars, but it was placed on file.

Preparing for Ice Sport—A club has been organized at Depere, Wis., to finance the construction of a windjammer car-sleigh which has been undertaken by Bertram Miller and Joseph E. Hallett, of the Hallett-Miller Auto Co., of Depere. The freak is being constructed of parts from a dozen different cars and will have the appearance of an iceboat. It will be propelled by a large two-blade aeroplane fan driven by a 50-horsepower motor. The seating capacity will be ten and the car is expected to make 80 miles an hour on Green bay. Other windjammers are being built by local clubs, and some exciting winter sport is expected to result on the Wisconsin lakes.

Taunton Judge Is Caught—When Judge William S. Woods, of the Taunton, Mass., district court, went motoring the other day he did not notice that he was hitting up a clip that was against the law and that two policemen were observing him. However, when his case was called in court, Judge Churchill, who has been habitually fining every motorist arrested for speeding at least $10, placed Judge Woods' case on file, although in doing so, it is said, he acted contrary to the law, which states that every person convicted must be fined at least $10, there being no provision for filing such cases.

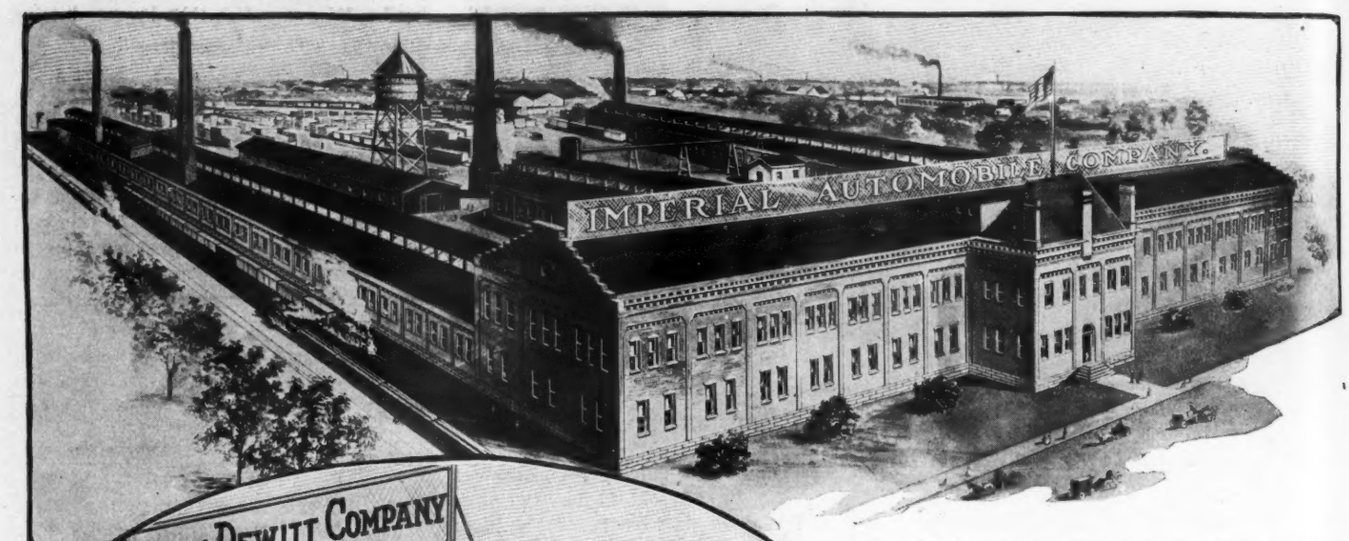
Driver Held Not Guilty—Several interesting questions were brought up to a jury in the case of the state of Wisconsin against Meinhard Lehse, aged 22 years, charged with assault with intent to do great bodily harm because his motor car struck a horse and buggy containing Mrs. Bertha Spartz and her three children on a country road. The verdict of the jury was not guilty. The court asked the jury to decide whether or not reckless driving of a motor car is as culpable under the law as reckless or dangerous use of firearms, but the question was not answered, as the jury found Lehse not guilty. The main issue was whether or not Lehse was guilty of assault with intent to do great bodily harm by running into the horse-drawn vehicle, and the jury decided "No." It appears that Lehse, who was driving considerably in excess of the speed limit, signaled for the right of way, which was given him for a moment, and then the woman driver let her horse back into the middle of the road just as Lehse attempted to pass.

Illinois Waking Up—Two important steps for the development of the highways of central and western Illinois were taken last week when two good roads organizations were formed, one at Whitehall and the other at Carlinville. The first association plans to improve the present dirt roads leading from Jacksonville to St. Louis via Roodhouse, Whitehall, Carrollton, Jerseyville, Alton and Granite City. The second is for the improvement of the highway from Springfield to St. Louis via Chatham, Auburn, Virden, Girard, Carlinville, Chesterfield, Medora, Brighton, Godfrey, Alton and Granite City. In addition to dragging the dirt route and putting it in the highest state of efficiency, active campaigns are under way for the construction of hard roads. The towns between Springfield and Chicago will also be asked to join in this movement to develop the main highway between these two cities and thus complete the chain to St. Louis. The Alton Automobile Club, which has been very active in posting the country roads, has offered a prize of $100 to the first good roads association that constructs a mile of hard roads.

Part 3—In the South

IN marked contrast to the illustration on the opposite page is this scene photographed near Mecklenburg, N. C., by the office of public roads of the United States government. Instead of being a muck hole, the road is as good as any boulevard and it is easy for two horses to pull a dozen bales of cotton

Among the Makers and Dealers



NEW PLANTS OF IMPERIAL AUTOMOBILE CO. AND THE JEFFERY-DEWITT CO.

INCREASING Capital Stock—The capital stock of the Harrison Dust Guard Co., of Toledo, will be increased from $10,000 to $700,000, of which $200,000 will be preferred and $500,000 common. The Michigan factory, it is claimed, will be removed to Toledo in the near future.

Means a Show in Toledo—The members of the Toledo Automobile Dealers' Association held a meeting last week and voted to form an exhibition company to promote a show in January. Incorporation papers have been sent to the secretary of state at Columbus. Dealers and accessory men only will be permitted to subscribe for stock in the company, the capital of which will be $10,000.

Westinghouse Interested—A new plant for the manufacture of motor car accessories will soon open in Pittsburgh, making way for 400 more workmen in this line. The Westinghouse Electric and Mfg. Co. is branching out into this business. The first floor of the former warehouse of the Bindley Hardware Co., in Shadyville, has been taken over by the Westinghouse interests and the machinery has been installed. It is believed that the plant will be in operation in about 2 weeks. Two hundred men and a like number of women are to be employed at the beginning.

Packard's Truck Business—The month of October was the best in the experience of the truck department of the Packard Motor Car Co. Orders averaged over seven a day from the large cities of the east and middle west, and taxed the capacity of the Packard shops, it is said. The demand was especially strong in New York, Boston, Providence, Albany, Philadelphia, Detroit, Chicago, Cleveland and St. Paul. A large percentage of the October sales were 2-ton Packards.

Receiver Appointed—William Miller, formerly bookkeeper for the Dayton Automobile Co., Dayton, O., has been appointed receiver for the concern by Judge O. B. Brown. The application was made by T. J. Weakley, vice-president of the concern, and other stockholders. The suit is an amicable agreement between the stockholders and officers, and the business will be continued for several weeks, pending the dissolution of the firm and the sale of its assets. The officers of the company are J. E. Studybaker, president; T. J. Weakley, vice-president; A. S. Iddings, secretary, and Dr. I. N. Agenbroad, treasurer.

Joining Indianapolis Industry—The American Box Ball Co., Indianapolis, Ind., of which the chief owners are J. I. Holcomb and Fred Hoke, is about to embark in the motor car business and expects to put out a six-cylinder car. Mr. Holcomb has been one of the partners in the Willis, Holcomb & Haywood Co. a few years ago, who controlled the Indianapolis agency for the Packard and several other cars. Mr. Holcomb retired from the motor car business a few years ago and took up the manufacture of box ball alleys.

Kissel Not Through Building—The Kissel Motor Car Co., Hartford, Wis., intends to continue its building and expansion activity through the cold months, more as a matter of necessity than convenience. Work has just been started on a large addition to the woodworking plant, and another core oven is being built in the foundry department. As soon as these improvements are well along attention will be turned to the work of providing more facilities for the commercial vehicle division, which is now cramped for room.

Good Business Outlook—Two interesting facts about the Pacific northwest are reported by George P. Moore, a San Francisco motor car man who has just returned from an extended trip through Oregon and Washington. According to Moore, that section will within the next few years become a very large consumer of cars. Already the demand is growing noticeably faster than it has heretofore, and as a natural sequence the question of good highways is becoming a burning issue. "I visited Seattle, Tacoma, Portland and several other centers," said Moore, "and

found business everywhere booming. The northwest is becoming one of the great motor centers of the country and they are using more and more cars there every year. At present they have hundreds of miles of good roads in use.''

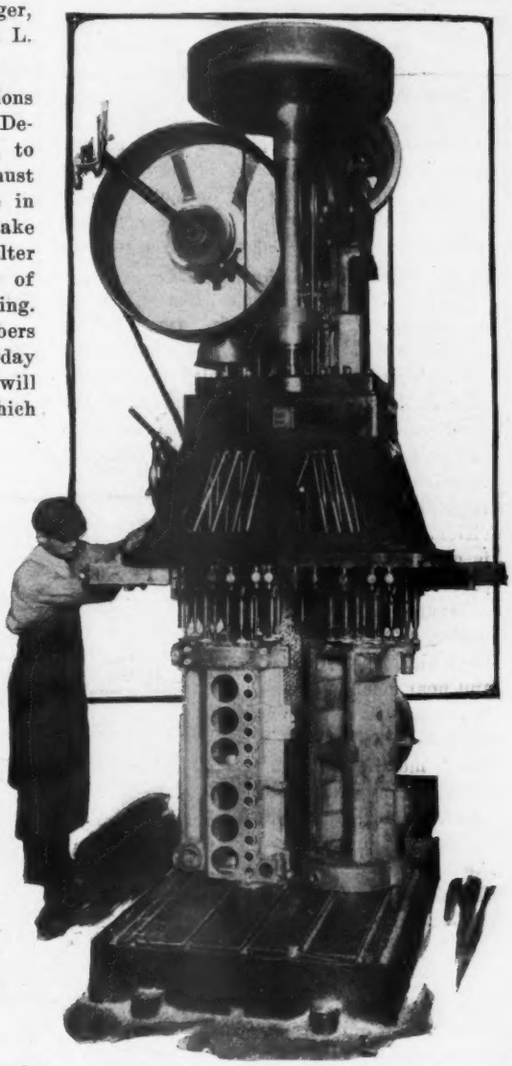
Adding to Its Toledo Plant—The Electric Auto Lite Co., Toledo, O., announces an addition to its plant at 133 and 135 Michigan street, providing for 40,000 square feet of floor space, will be built at once. The work already is under way and the company expects to be installed in the new building before the new year. The Electric Auto Lite Co. manufactures a combined electric lighting and starting system for motor car equipment. The officers of the Toledo company are Artemus W. Fisher, president; Clement O. Miniger, secretary and treasurer, and Sherman L. Kelly, manager.

Detroit Ready to Draw—All applications for space for the annual show of the Detroit Automobile Dealers Association, to be held again at the Wayne Gardens, must be in by November 20 to participate in the drawing for spaces, which is to take place at the offices of Manager Walter Wilmot, who will again have charge of the annual show, at 501 Bowles building. The drawing for spaces for the members of the D. A. D. A. will take place Saturday evening, November 23. Non-members will participate in the second drawing, which takes place November 25.

Jeffery-Dewitt Expanding — The Jeffery-Dewitt Co., Detroit, Mich., manufacturer of the Reliance brand of spark plugs and the new J-D Visible, has been forced by increasing business to occupy new quarters in addition to its large original factory. Accordingly, a new site on East Grand boulevard has been chosen, and the entire assembling and shipping will be carried on hereafter at this plant, No. 2. The new building allows 6,000 additional feet of floor space. Plant No. 1, the original factory, hereafter will be devoted solely to the manufacture of porcelains and the machining of metal parts.

Pushing Rambler Sales — The Thomas B. Jeffery Co., of Kenosha, Wis., manufacturing the Rambler, is at this time more than 700 cars behind its orders for immediate delivery, and has on its books contracts for 40 per cent more cars than were produced by the big works throughout the 1912 season, it is claimed. During the period from July 15 to October 15, fifty picked salesmen engaged in a contest. The fifty united with 560 dealer representatives from coast to coast. At the beginning of the contest each of the fifty men was given a quota based on estimated possible business in his territory. Upon each sale of a car, the man was credited with a certain number of points. With more than 7 months to go before the 1913 season ends, the San Frisco branch already has sold 97.5 per cent of the estimated output for the entire year; Milwaukee, 85 per cent; Chicago, 40 per cent; New York, 97 per cent, and Boston, 30 per cent.

New Branch for Firestone—Work is now under way on a new building for the Firestone Tire and Rubber Co. in San Francisco. The Akron company at present occupies a fine structure on lower Van Ness avenue, but the plans of the city for a municipal civic center will require the demolition of this building. The Firestone branch will follow the general line of march to the upper end of Van Ness avenue, which will now become the motor row of San Francisco. The building will be at Van Ness and Austin avenues, between Bush and Pine streets, with a frontage of 70 feet on Van Ness avenue and 31.9 feet on Bush street. The structure will be two stories in height, with a full and high-ceiled basement. W. H. Bell is manager of the branch.



BIG CHALMERS DRILL

THE Chalmers Motor Co. has completed the installation of one of the largest multiple spindle drills ever built. The accompanying illustration shows the new machine operating on two Chalmers six crankcases with twenty-seven spindles in operation. This machine has a total capacity of thirty spindles. Some idea of the size of the machine will be gained from a comparison with the workman who is operating it. This operator is fully 6 feet in height

White Buys Boston Site—President Windsor T. White and Vice-president Walter C. White, of the White Co., visited Boston last week and while there had a conference with Manager Josiah S. Hathaway, of the Boston branch, after which papers were signed by which the company purchased more than an acre of land on Commonwealth avenue next to the new Kisselkar building on which will be erected a salesroom and service department. The old building at the corner of Newbury and Hereford streets now used by the company was taken in part payment for the deal.

Outlook in Minnesota—Bank clearings in the Twin Cities, and increased wholesale business, with tremendous grain receipts at the Minneapolis terminals, are taken by financiers to indicate increasing business for the remainder of the year and to continue into next year. G. H. Tunnell, chief deputy grain inspector in Minnesota, predicts a grain yield in the northwest that will exceed all records by 35,000,000 bushels. Carl R. Gray, new president of the Great Northern road, says: ''Business is excellent over all sections of our lines and the country appears to be in the most prosperous condition.''

To Make the Beaver Six—The Beaver Six is the name of a new car to be manufactured in Portland, Ore. A group of Portland business men, headed by P. A. Coombs, filed incorporation papers for the $300,000 Beaver State Motor Co. The first car has been manufactured and in a short time announcement will be made of the site of a $30,000 plant. P. A. Coombs and J. A. Friddle are the designers of the car, which will be in two models, roadster and touring car of 45 horsepower. The officers of the company are P. A. Coombs, president; G. A. Johnson, vice-president; Julius L. Bailey, secretary. Temporary quarters have been established at 309 Oak street.

After Four-State Alliance—The next monthly meeting of the Automobile Dealers' Association of Illinois will be held on November 26 at Springfield. At the recent meeting in Peoria, a committee was appointed to investigate a proposed affiliation with the state associations of Iowa, Wisconsin and Indiana. It was suggested that the four-state organization would prove advantageous in many ways, being mutually protective and beneficial. It also was voted to affiliate with the Illinois Highway Improvement Association. At the semi-annual meeting to be held in Chicago in connection with the annual show in February there will be addresses by leading authorities on good roads.

Development Briefs

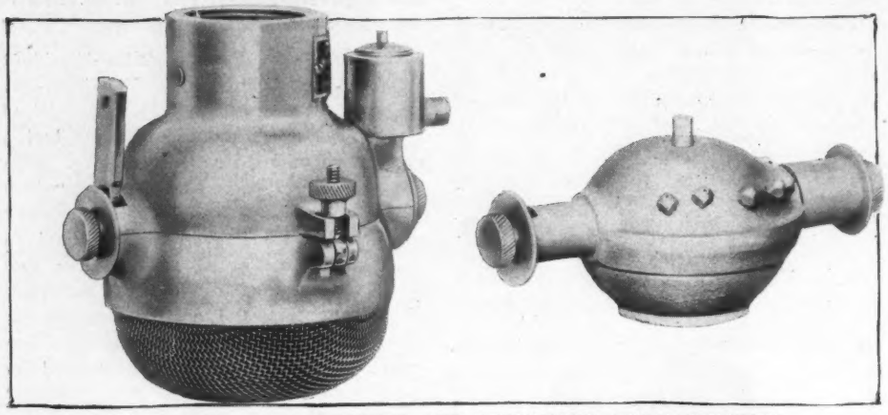


FIG. 1—A. B. C. CARBURETER AND REMOVABLE FLOAT-CHAMBER

National Compound Mixer and Primer

PRIMING with raw gasoline sometimes results favorably, sometimes does not. When it does not it is usually because either too much or too little gasoline is admitted to the cylinders or intake manifold. This is because in injecting liquid gasoline it is a matter of pure guesswork, in most cases, as to the amount that is being used. For the purpose of measuring the proportion of gasoline to air in the priming charge by means of mixing the constituents into a vapor of uniform density, the National compound mixer and primer, shown in Fig. 3, is produced by the National Mfg. Co., Kalamazoo, Mich.

This device consists of two cylinders, which are attached to the dash, one of which, the primer, contains a supply of gasoline, which it feeds through a nozzle to the other, the mixer. In the top of the mixer is a screened opening, through which air is drawn, the mixture being lead through a tube leading from below the mixer cylinder to the manifold. In operation, the valve between the primer and mixer is opened for a few moments, allowing a supply of fluid to flow into the mixer. This valve is then closed, and the lower one opened. The charge is then allowed to pass into the manifold, whence it is drawn into the cylinders, upon the motor being cranked.

A. B. C. Carbureter

Without adjustments, without springs, and without air valves, a new carbureter has been produced by the International Accessories Mfg. Co., New York, which is shown in Figs. 1 and 5. The manufacturer of this carbureter claims that the same instrument may be placed on any number of different motors, within the range of the carbureter size, with better results than can be obtained with an adjustable carbureter. These claims are based on a unique construction that embraces many radical departures from usual design. Principal among these is a detachable float chamber, upon which several nozzles of different-sized orifices are disposed, which is used furthermore to control the admission of air into the mixing chamber. The only moving parts are the float, float-chamber, and throttle.

The instrument consists substantially of a casing, constructed in two halves, within which is a removable float chamber. This communicates with the supply. The float is circular, and the shape of the float chamber is such that the capacity and level of the fluid within the chamber remains the same regardless of its position. Its rotation is controlled by the throttle lever, which is secured to the opposite axis to that in which the feed and float mechanism is situated. The throttle is linked to this member by means of a jointed lever, so as to open in conjunction with the movement of the float chamber on its axis.

The action of the device is wholly by the throttle lever. The float chamber is in reality a secondary air throttle, the air admitted depending upon the extent to which it is tipped. The rotation of the float chamber not only varies the amount of air admitted, to the mixing chamber, but it governs the amount of gasoline fed through the nozzles. In the vertical position, all of the nozzles are above the gasoline level, and the air opening is closed. When moved slightly, the first nozzle is brought into play, being brought to a position below the gasoline level. This also admits a small amount of air. As it is further revolved on its axis, more of the nozzles are brought into play, and more air is admitted, until with the throttle fully open, the full charge of air is drawn in, and gasoline is fed through all of the nozzles. This variation in the proportion of the charge is accurately worked out, and as it varies in accordance with the throttle opening, the mixture is said to be adapted separately for each speed variation.

The removable feature of the float chamber permits it to be removed and cleaned, without tools, and without shutting off the gasoline. Removed and emptied, it constitutes a practically invulnerable motor car lock.

Reacto Electric Horn

Newest among electric signals is the Reacto horn, the product of the Holtzer-Cabot Electric Co., Brookline, Mass. The Reacto horn, Fig. 6, is of the simple vibrating armature type. It differs from the usual type of vibrating signal in that

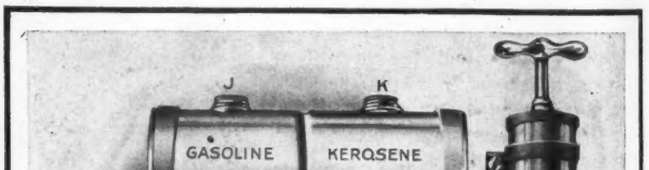


FIG. 2—THE PERFECT STARTER AND DECARBONIZER

the armature does not strike the diaphragm under the attraction of the magnet, but upon the reaction, or rebound, whence its name. Whereas the reaction of the spring is equal to the action of the magnet, the result is the same; with the advantage that the design is greatly simplified and the action is more direct.

It also is claimed that this signal is more accessible than other types. The diaphragm is 5½ inches in diameter, of tempered steel. A case-hardened button

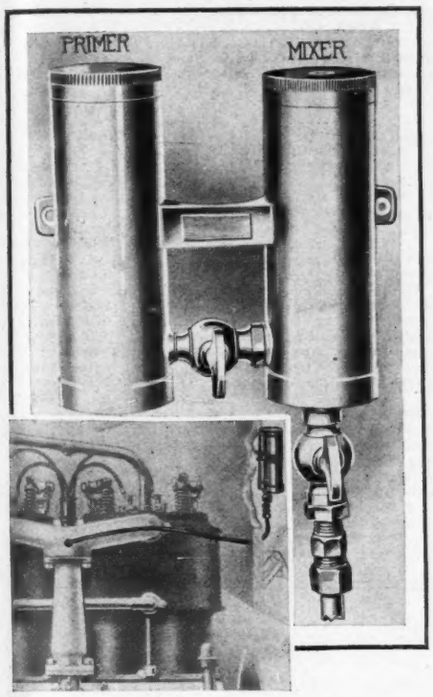


FIG. 3—NATIONAL COMPOUND MIXER AND PRIMER

on the diaphragm is struck by another on the armature, both being insulated from the main structure. The platinum points are heavy, and a condenser is connected across the contact points. There is but one adjustment, which has a wide range, it is said, and therefore requires no attention if the battery charge is kept within from 4 to 8 volts.

Perfect Starter and Decarbonizer

Gasoline is the operating medium of the starter and decarbonizer, Fig. 2, which is the product of the Bastian-Blessing Co., Chicago. Kerosene is used for the decarbonizing function, both fluids being contained in the tank F. This tank is mounted on the front of the dash, where it is convenient to fill and the piping is short. From the tank the gasoline is piped to a foot plunger-valve A and from thence to the vaporizer D. From D a pipe leads to the two-way valve B, and into the plunger-pump E. Valve C is the outlet of the pump and is connected to the cylinder valves G. The kerosene is lead from the tank direct to the two-way valve B.

In starting, the valve A is opened by pressure of the foot. This permits a supply of gasoline to enter the vaporizer D. The valves C and B are then placed in the open position, as shown, and the pump given three or four full strokes. This charges the cylinder with an explosive mixture of air and gasoline, the air being introduced in the vaporizer through an air inlet. The engine is then started on the spark.

In decarbonizing, the valve B is turned to the right, admitting kerosene to the pump. The pump need not be operated when the motor is running, as the engine suction will draw the kerosene from the tank. It is it desired to leave a charge of kerosene in the cylinders over night, it may be pumped into them by hand, when the motor is idle.

At I is the adjustment of the vaporizer, which measures the amount of gasoline to be used in different temperatures. H is the overflow connection, which is used when the vaporizer is placed over the mud-pan, a section of tubing being connected thereto to conduct the overflow directly to the ground. Valves G are furnished with extensions for motors of unusual thickness of wall.

These outfits are furnished complete, ready for installation, as shown in the figure.

Cramp Gear Bronzes

In the use of worm gearing, perhaps more so than in any other type of gearing, the quality and adaptability of the metal used is most important. Having had a wide range of experience in gear and worm-gear metals, the William Cramp & Sons Ship and Engine Co., of Philadelphia, has produced a special line of worm-gear bronzes especially designed for their particular uses. It will be apparent that what is a good metal for one class of work, is not the sort at all for another. No less than six different types of metals are offered by the Cramp company for the various classes of service to which worm gears are likely to be put.

Five of these alloys are of a special gear metal that is produced by the Cramp company, and the sixth is Parson's manganese bronze. Grade No. 1 of the gear metal is for light loads and high speeds, grade 2 is for moderate loads and speeds, grade 3 for moderate loads and speeds

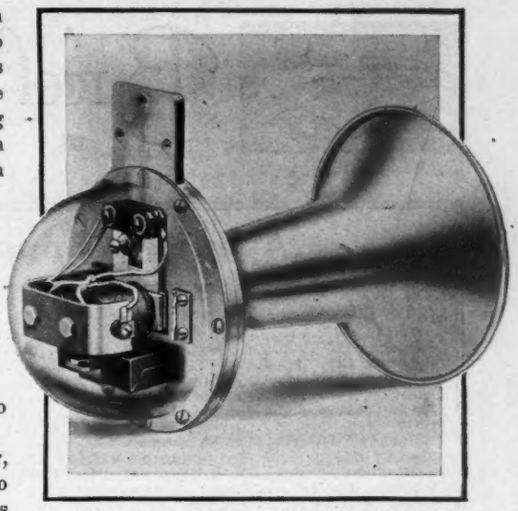


FIG. 6—REACTO ELECTRIC HORN

where excessive wear is expected, grade 4 for continuously moderate loads with intermittantly heavy load, and grade 5 for average running conditions of light loads and moderate speeds with heavy starting torque. Parson's bronze is for heavy loads and slow speeds, under excessive strain and shock.

These metals differ radically, gear metal No. 1 consisting of a very strong, tough metal thoroughly hardened, and is especially adapted for use in worms with cast iron wheels. No. 4 is much softer, is more elastic, and has not so much tensile strength. Parsons manganese bronze, on the other hand, is of great tensile strength, although elastic, and holds its strength even after excessive wear. It is not adapted, however, to high speeds.

For motor car work the bronzes are still different from these, being in two grades for use with medium loads, as in pleasure cars, and heavy loads of great inertia, as in motor trucks. These bronzes are made hard for the former use, where weight must be saved, and soft for the latter use, where weight does not matter, and where the great starting torque requires a metal that can adjust itself to severe loads imposed upon it, and its resistance to abrasion. These metals may be procured in castings ready for machining, made from almost any type of pattern.

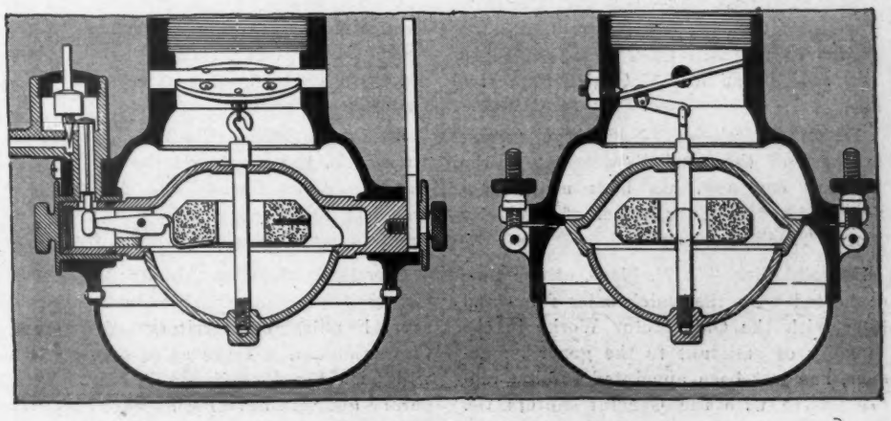


FIG. 5—SECTIONAL VIEWS OF A. B. C. CARBURETER

Brief Business Announcements

Agencies Appointed by Motor Car Manufacturers

Town—	Agent	Car
Arcata, Cal.	J. P. Rusthol	Cole
Atlanta, Ga.	Roger Kees	Baker
Atlantic City, N. J.	W. B. Thompson	Cole
Auburn, Neb.	Workman & Rozean	Reo
Auburn, Neb.	Workman & Rozean	Little
Avoca, Ia.	Nort & Derby	Little
Baltimore, Md.	Charter Automobile Co.	Havers
Belgrade, Neb.	W. H. Andrews	Cartercar
Boston, Mass.	Dodge Motor Vehicle Co.	Buffalo
Bridgeport, Conn.	D. & H. Auto Distributing Co.	Klinekar
Buffalo, N. Y.	Edgar C. Messersmith	Wagenhals
Buffalo, N. Y.	Windsor Motor Car Co.	Klinekar
Cambridge, Md.	E. J. Brannock	Marathon
Central City, Neb.	Linderman & Blake	Michigan
Charleston, Mo.	Luke Howlett	Moon
Cincinnati, O.	F. H. Berold	Havers
Columbus, Neb.	E. A. Smith	Cartercar
Columbus, O.	O. G. Roberts & Co.	Gramm
Columbus, O.	Murnan Taxicab Co.	Moon
Columbus, Pa.	Columbia Auto Co.	Mitchell
Des Moines, Ia.	Van Vliet-Bradt Motor Co.	Moon
Elliott, Ia.	M. Lembke	Michigan
Elyria, O.	H. M. Andress & Co.	Havers
Fall River, Mass.	Eckberg & Place Garage Co.	Franklin
Franklin, Pa.	King Automobile Co.	Klinekar
Frederick, Md.	H. A. Hann	Krit
Frederick, Md.	James E. Solt	Paige-Detroit
Fullerton, Neb.	T. M. Sheath	Cartercar
Hartford City, Ind.	A. W. Tindall	Cole
Hartington, Neb.	Nelson & Roskopf	Studebaker
Hannibal, Mo.	Long Mfg. Co.	Moon
Kansas City, Mo.	Bond Motor Co.	Gramm
Kansas City, Mo.	Warriner & Dailey	Federal
Lincoln, Neb.	Wertz Auto Co.	Studebaker
Lowell, Mass.	Joseph Marin	Rambler
Marcus, Ia.	Johnson, Petty & Johnson	Moon
Melrose, Mass.	Smith Brothers Garage Co.	Overland
Memphis, Tenn.	Tennessee Motor Co.	Buick
Memphis, Tenn.	V. L. Gogers	Stearns
Milwaukee, Wis.	W. E. Allen Co.	Marathon
Milwaukee, Wis.	Wolleager Sales Co.	Studebaker
Minneapolis, Minn.	Alexander Brunner	Klinekar
Newark, N. J.	MacArthur-Zollars-Thompson Co.	McIntyre
New Orleans, La.	Arthur Marullo	Dart
New York	Gildel Auto Co.	Klinekar
Norfolk, Va.	C. L. Young	Cole
Ogallala, Neb.	Jay Ellingsworth	Studebaker
Orange City, Ia.	Aerrote Van Der Wilt	Moon
Plattsmouth, Neb.	Kroehler Brothers	Cartercar
Providence, R. I.	Henderson	J. B. Higginson
Reno, Nev.	Reo Nevada Co.	Cole
Rochester, N. Y.	Beardsley & Gallagher	Havers
San Francisco, Cal.	W. T. Stone	Standard
Schleswig, Ia.	G. T. Hollander	Michigan
Seattle, Wash.	Louis Roesch	Velie
South Bend, Ind.	Warde L. Mack	Franklin
Spokane, Wash.	W. R. Dean	Stevens-Duryea
St. Paul, Minn.	J. B. Archer	National
St. Louis, Mo.	Maxwell Motor Sales Co.	Maxwell
St. Louis, Mo.	Neustadt Automobile & Supply Co.	Marion
St. Louis, Mo.	Meyer-Busch Automobile Co.	Speedwell
St. Louis, Mo.	Meyer-Busch Automobile Co.	Brown
St. Paul, Minn.	Fossens-Satterlee-Babcock Co.	Pope-Hartford
Suffolk, Va.	B. E. Parker	Cole
Springfield, Mass.	Bunker-Reopwell Co.	Chevrolet
Springfield, Mass.	Bunker-Reopwell Co.	Little
Springfield, Mass.	Bunker-Reopwell Co.	Rambler
Toledo, O.	Moon Sales Co.	Moon
Wall Lake, Ia.	Hopkins & Herrig	Moon
Wakefield, Neb.	Utecht & Elmer	Moon
Washington, D. C.	David S. Hendrick	Abbott-Detroit
West Point, Neb.	Kirkow & Ickman	Cole
Vancouver, B. C.	A. S. French Auto Co.	Havers
Yankton, S. D.	F. J. Nyberg	Moon

WINNIPEG, MAN.—The Winnipeg garage has removed to its new premises, 263 Edmonton street.

St. Catherines, Ont.—J. M. Lydiatt has opened a garage and accessory depot at 8 Head street.

Detroit, Mich.—F. A. Harris has taken the position of assistant manager of the Hupp Motor Car Co.

Winnipeg, Man.—The Electric Sales and Repair Co. is the name of a new plant recently incorporated to do business in Winnipeg.

Lima, O.—The McLeod & Barr Auto Sales Co. is the name of a new concern which has opened a salesroom to handle the Ford line on West North street, Lima.

San Francisco, Cal.—The Carl Christensen Motor Car Co., distributor of the Detroiter in northern California, has taken new quarters at 561-567 Golden Gate avenue.

Detroit, Mich.—A. S. Holly, former manager of the truck department of the Packard company, has been made manager of the New York branch of the Kelly Motor Truck Co.

Detroit, Mich.—L. W. Place, at one time connected with the Buick sales force and later with the Olds Motor Works in the capacity of assistant to the general manager, has just been appointed foreign representative with the General Motors Co. He will be gone approximately 18 months and during that time will cover a vast amount of territory, visiting every country of note on the eastern hemisphere.

Columbus, O.—The I. J. Cooper Rubber Co. is the name of a new concern located at 263 North Fourth street, which deals in tires.

Boston, Mass.—L. H. P. Lowe, formerly connected with the Thomas B. Jeffery Co. of Boston, handling the Rambler line, has resigned to accept a position as sales manager of the Dodge Motor Vehicle Co.

Green Bay, Wis.—Jones & Indra, 149-151 North Broadway, who erected a large new garage a year ago, have started work on an addition which will double the capacity.

Boston, Mass.—W. H. Stevens, who has the National agency in Boston, has moved from the Autocar building on Beacon street to 1020 Boylston street near Massachusetts avenue.

St. Joseph, Mich.—The St. Joseph Automobile Co. has purchased the interests of the St. Joseph Garage and Auto Livery and has under construction a new fireproof building which will be 64 by 125.

Cleveland, O.—The Abbott Motor Car Co. of Cleveland, O., has been allotted several miles of territory surrounding Cleveland and a large sales organization will push the Detroit car briskly. Temporary quarters have been secured at 2027 Euclid avenue. The officers of the company are: President, W. F. Schmitt, vice-president and general manager, C. H. Davies; secretary and treasurer, J. J. Schmitt.

Columbus, O.—Edward T. Paul, 123 Parsons avenue, has established a vulcanizing and tire repairing shop.

Fresno, Cal.—T. B. Shelton has been appointed manager of the Fresno branch of Don Lee, California distributor of the Cadillac.

Detroit, Mich.—Harold Smith has given up his position as advertising manager of the General Motors Truck Co., Pontiac, entering the Carl M. Green Advertising Agency.

Vancouver, B. C.—Charles E. Smith is completing a garage on First avenue near Commercial drive. It has a frontage of 75 feet and is 22 feet deep. It will accommodate twenty cars.

Philadelphia, Pa.—The local branch of the Firestone Tire and Rubber Co. is now established in new quarters at 304 North Broad street. In the rear, with entrances at 1409 and 1411 Vine street, is a garage.

Cleveland, O.—J. Preston Lyons, formerly Buffalo district manager for the Electric Products Co., manufacturer of automatic charging devices for electric cars, has been appointed district sales manager for Chicago territory. His office hereafter will be at 607 Marquette building. James M. Kelley has been appointed district sales manager, with an office at Buf-

falo, N. Y. John T. Fitzsimmons has been appointed district sales manager in the Cincinnati territory.

San Francisco, Cal.—The Chanslor & Lyon Co. has contracted to handle Lee tire products on the west coast.

Syracuse, N. Y.—A. H. Davis has rejoined the staff of the Franklin Automobile Co. and will act as a special field representative.

Albany, N. Y.—The Albany branch of the Franklin Automobile Co. has been bought by Clarence G. Heck, who will conduct it on the regular Franklin dealership basis.

Phoenix, Ariz.—Local persons have incorporated the Overland Auto Co. and opened a new garage on Third avenue. Overland machines are handled exclusively. A. S. Earhart is manager of the new company.

Springfield, Mass.—Henry F. Blanchard, well known as secretary of the Blanchard Press in Worcester, Mass., has resigned to accept a position in the executive department of the Knox company at Springfield.

Cincinnati, O.—The Price Hill Auto Co., of Cincinnati, O., has filed papers with the secretary of state changing the name to the Radel Auto and Garage Co., and also for increasing its capital stock from $1,000 to $100,000.

San Francisco, Cal.—The Kline Motor Car Corporation has opened a branch in San Francisco. It will be in charge of Frank O. Renstrom & Co., who will act as distributors for California and the coast territory.

Portland, Ore.—W. S. Dulmage has purchased the interests of D. M. Smith in the firm of Dulmage & Smith, and is now sole owner of the Dulmage Auto Co., not incorporated, continuing business at the old location, 46-48 North Twentieth street.

Baltimore, Md.—The Franklin Auto Co., A. J. Miller manager, has outlived its present quarters and will move to larger quarters at 1919 North Charles street after November 1. The new location is now occupied by the D. C. Walker Auto Co.

Boston, Mass.—The Standard Tire and Rubber Co. no longer has the New England business of the Motz Tire and Rubber Co. A direct Boston branch has been opened with M. A. Frank in charge. The branch is located at 4 Dundee street.

Fredricton, N. B.—Willis McPherson is to remove his foundry and machine shop here from St. Mary's. He will open a garage. It may be that a joint stock company will take over the business which is to be carried on on an extensive scale.

San Francisco, Cal.—The Piggins Motor Truck Co. of Racine, Wis., has established a factory branch in San Francisco, to take care of the entire Pacific coast. J. I. McLaughlin is manager. Arrangements are now being made for the erection of a permanent building on Golden Gate avenue. McLaughlin also will be factory representative of the Inter-State in this territory.

Toronto, Ont.—The Ross Motor Car Co., Ltd., is handling Canadian territory for the Regal Motor Car Co., of Detroit.

Vancouver, B. C.—The Kelly-Springfield Tire Co., of New York, has opened a branch office in this city with Harry R. Sayer as manager.

Winnipeg—The Breen Motor Co., Ltd., has been appointed sole distributor for the Cole in the provinces of Manitoba, Saskatchewan, Albert and British Columbia.

Brantford, Ont.—W. P. Blanchard, of Detroit, has been appointed manager of the Keeton Motor Car Co. of this city. Operations will be commenced within a few weeks.

Buffalo, N. Y.—B. F. Morris has been appointed manager of the local factory branch of the Republic Rubber Co., which recently took over the interests of the Bison Rubber Co., its local selling agent.

Hartford, Wis.—Charles H. Lohr and Howard Danielson have leased the Hacker building and remodeled it into a garage and repair shop. The firm has the district agency for the Ford in Dodge and Washington counties.

Amesbury, Mass.—The Walker & Wells Co., maker of bodies, is having completed an addition to its factory on Railroad of a building 40 by 100 square feet, two stories high, to be used for the storage of lumber and metal.

Savannah, Ga.—A branch of the Buick Motor Co.'s factory is to be established in Savannah. J. E. Finney, who has been in charge of the agency for some years, will remain at the head of the concern. Hereafter all the Buick company's business in this section will be handled directly through the local branch.

Savannah, Ga.—Stephen N. Harris, of the Harris Tire Co., has purchased the property on the northwest corner of Drayton and Perry streets, now occupied by the Harris Tire Co. Harris will improve the property and use it as a branch house after he has built his new garage on the property at Bull and Harris streets.

Philadelphia, Pa.—Thomas R. Roberts has resigned the sales managership of the United Motor Philadelphia Co. and formed a co-partnership with Charles M. Reeves to take over the agency for this territory of the Marion car. Under the firm name of Roberts & Reeves headquarters have been established at 1336 Race street.

Toronto, Ont.—A seven-story reinforced concrete garage and sales building is being erected at the corner of Shepherd and Temperance streets by the Central Garage and Supply Co. for the exclusive sale of Abbott-Detroit cars. The building will cost $150,000 and will be ready for occupancy about December 1. There will be a total of 255 feet of display windows facing the two streets on the ground flow. T. S. Blues is president and general manager and Thomas Enright secretary and treasurer.

Detroit, Mich.—The Michigan Steel Castings Co. has increased its capitalization from $60,000 to $90,000.

Cambrose, Alta.—Kennedy, Eltrich & Co. are to occupy a new garage very shortly. This is the building that is being put up on Paulson street here.

San Francisco, Cal.—The Standard Electrique is now represented in northern California by W. T. Stone, successor to R. B. Daggett & Co., formerly agents of the Baker electric.

Baltimore, Md.—A new arrival in Baltimore is the Stutz, which will be handled by the Stutz Sales Co., with headquarters at North avenue and McCulloh street. Walter Scott is manager of the new company.

Lima, O.—W. L. McKenzie and F. W. Holmes have purchased the Electron building at Lima and will erect a large garage in the rear to be leased to a local concern. The garage will be 100 by 50 feet and two stories high.

Toledo, O.—The last of five new buildings to be erected on Madison avenue for the sale of cars and accessories is that of the Six Realty Co., which will extend the Madison avenue row westward. The five structures are either under way at the present time or are in the hands of architects.

Columbus, O.—The Twyman Motor Co., jobber for the Studebaker in Ohio and portions of the states of West Virginia, Kentucky, Pennsylvania and Indiana, has established a branch at 815 Race street, Cincinnati, under the management of L. H. Scarlett. The company has a branch in Dayton, O.

Columbus, O.—C. E. Gwinn, agent for the Lozier and the Davis in central Ohio, has moved his salesroom from 215 North Fourth street to 172 North Fourth street. Amos White, agent for the Everitt and the Flanders electric, formerly located on Mt. Vernon avenue, is also located at 172 North Fourth street.

Indianapolis, Ind.—With an authorized capitalization of $150,000, the Ham-Meix Mfg. Co. has been organized and incorporated in Indianapolis to manufacture self-starters for gasoline motors. Those interested in the company are Harry W. Hamilton, Benjamin F. Meixell, Harold Taylor and Samuel B. Sutphin.

Indianapolis, Ind.—J. R. Zimmerman has been appointed Indianapolis agent and E. M. Holmes Indiana distributor for the Detroiter and Cutting lines. They have established headquarters at 330 North Illinois street. Harry L. Hammond, formerly sales manager for the Archey-Atkins Automobile Co., and F. Ellis Hunter, formerly with the Gibson Automobile Co., have organized the Hunter-Hammond Auto Co. and have established quarters at 517 North

Capitol avenue in Indianapolis. The company will be the Indiana distributor for the Reo.

Brandon, Man.—Dennison Brothers, Seventh street, are putting up a two-story brick garage, 60 by 120 feet.

San Francisco, Cal.—E. A. Shouse has been appointed sales manager of the C. & F. Motor Car Co., northern California distributor of the Stutz car.

Newport, Pa.—A large new garage is being erected by John L. Snyder on Third street. The building will be fireproof, built of cement blocks, with cement floor and steel roof.

Buffalo, N. Y.—The Lippard-Stewart Motor Car Co. of Buffalo has appointed J. R. Elliott district manager for the states of Washington and Idaho and the province of British Columbia.

Syracuse, N. Y.—Malcolm B. Richardson, formerly with the Remy Magneto Co., has been appointed district sales manager in the southern territory for the Franklin Automobile Co. He will make his headquarters at Atlanta, Ga.

Toronto, Ont.—A new company to handle Warner Auto Meters in Europe and Canada has been incorporated under an Ontario charter and will be known as Donald F. Johnston Co., Ltd. Mr. Johnston has gone to Europe with the intention of opening a branch in London.

Detroit, Mich.—F. W. Kurtz has announced his retirement from the position of director of advertising for the General Motors Co., the work and purpose of the advertising department of the General Motors having been accomplished. This department at the general offices has been discontinued, each individual plant now having its own publicity and advertising department.

Detroit, Mich.—The Anderson Electric Car Co. has appointed S. W. Menefee manager of its New York branch.

Montreal, Que.—S. Gagnon, 1924 Boulevard street, Lawrence, Montreal, has been appointed sole agent for the province of Quebec for the Rambler car.

Boston, Mass.—The Lexington Motor Car Co. of New England, which handled the Lexington line with headquarters at 1020 Boylston street, Boston, has gone out of business.

Albany, N. Y.—John B. Hauf, a furniture and carpet dealer, is having constructed a garage and storehouse, dimensions of new building being 110 by 44 feet, the cost to be about $30,000.

San Jose, Cal.—George L. Magneson, a wealthy rancher of this county, has taken the Santa Clara county agency for the Stoddard-Dayton pleasure cars, Baker electric and Federal truck. He will erect a large garage in this city.

Tiffin, O.—Councilman C. A. Jones has purchased the plant of the Ohio Stove Co. on Lafayette street, which will be razed and a modern garage constructed. The firm of Jones & Co. will operate the garage when completed.

Buffalo, N. Y.—Announcement is made of the appointment of two new district managers for the Stewart Motor Corporation, of Buffalo, maker of the Stewart light delivery truck. E. E. Dennison has been appointed district manager for Illinois, eastern Iowa and Missouri, with headquarters at Chicago. W. T. Butler has been appointed district manager for New York state, northern Pennsylvania, with headquarters at Buffalo.

Montreal, Que.—The Cotey Motor Truck Co., Ltd., has been incorporated in Montreal with a capitalization of $400,000.

Phoenix, Ariz.—A Hupmobile distributing agency has been established in Phoenix with J. S. Morrison, formerly of Los Angeles and San Diego, in charge. His territory includes Arizona, New Mexico and the northern part of Old Mexico.

St. Paul, Minn.—A. J. Sarjeant is to manage the new Ford branch in St. Paul. Mr. Sarjeant was in charge of the Northwestern Automobile Agency, which handled the Ford until October 1. The location of the Ford sales department is not announced.

Philadelphia, Pa.—The Wallace Automobile Co., 332 North Broad street, local distributor of the Pope-Hartford, has acquired the agency of the Modern truck for Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina and South Carolina.

Buffalo, N. Y.—The new building being constructed by the Packard Motor Car Co. at Main and Summer streets will provide for a well appointed sales room, general offices and a service station with complete facilities for inspection and overhauling.

Winnipeg, Man.—The Hart Accumulator Co., of London, Eng., manufacturer of storage batteries, will establish a factory in western Canada. E. J. Clarke, managing director of the company, will recommend that a large plant be built at either Winnipeg or Fort William.

Akron, O.—Akron Welding Co., capital stock, $10,000; to manufacture parts; incorporators, M. W. Smith, G. I. Stuber, E. H. Boyland, D. H. Morgan.

Birmingham, Ala.—Alabama Tire Repairing Co., capital stock, $15,000.

Boston, Mass.—A. W. Cox & Co., capital stock, $10,000; directors, N. B. Todd, Charles B. Baldwin, A. W. Cox.

Boston, Mass.—Eliot Motor Car Co., capital stock, $250,000; incorporators, M. H. Libby, R. G. Houston, W. D. Wallace.

Brooklyn, N. Y.—Carlton Garage, capital stock, $5,000; incorporators, J. F. Cox, M. J. Cox, P. H. Fett, K. Fett.

Brooklyn—Brooklyn Auto Top & Supply Co., capital stock, $5,000; incorporators, B. H. Matton, J. Seigel, E. Chinnock, Jr.

Brooklyn—Sea Gate Garage & Automobile Corp., capital stock, $5,000; incorporators, J. F. Curtin, H. O. Couglan, T. K. Mallaby.

Brooklyn—H. J. & S. Co., capital stock, $1,000; to manufacture and deal in rubber articles; incorporators, J. Mattison, H. Jacobson, S. Glass.

Cambridge, N. J.—Hendricks Mfg. Co., capital stock, $250,000; to deal in accessories; incorporators, F. R. Hansell, J. A. MacPeak, F. B. German.

Chicago—National Oil Gas Generator Co., capital stock, $5,000; to manufacture carburetors; incorporators, W. D. Hawk, S. S. Holmes, G. E. Dierssen.

Chicago—Electric Motor Chair Co., capital stock, $50,000; to manufacture motor propelled chairs; incorporators, C. B. Crysler, J. G. Bennett, C. B. Traver.

Chicago—E. C. Demountable Wheel Co., capital stock, $2,500; incorporators, G. A. Oleson, V. G. Kropf, S. S. Gorham.

Chicago—Abbey Auto Livery Co., capital stock, $2,500; general motor car business; incorporators, G. W. Waterman, J. K. Lennox, C. A. Blackwell.

Chicago—Hanway Starter Co., capital stock, $75,000; to manufacture and deal in starting devices; incorporators, J. D. Rourke, I. Goldstein, R. C. Nicholson.

Recent Incorporations

Chicago—Michigan Avenue Garage Co., capital stock, $5,000; to do general motor car livery business; incorporators, E. L. Richter, J. D. Donnell, A. J. Moran.

Farmington, Me.—Metcalf Auto Co., capital stock, $10,000; incorporators, J. C. Metcalf, J. C. Morton, J. W. Barker.

Fort Wayne, Ind.—Eureka Garage Co., capital stock, $10,000; incorporators, T. B. Adams, A. E. Smith, C. H. Buhr.

Gloucester City, N. J.—Auto Tire Repair & Supply Co., capital stock, $100,000; general motor car business; incorporators, J. Michel, T. G. Golden, T. J. Manning.

Houston, Tex.—Motor Transfer Co., capital stock, $3,000; incorporators, A. H. McGowen, Henretta Dixon, J. Wilson.

Milwaukee, Wis.—Archambault Motor Sales Co., capital stock, $25,000; incorporators, W. M. Spooner, L. Quarles.

Milwaukee, Wis.—Milwaukee Tank Works, capital stock, $25,000; to manufacture tanks; incorporators, E. A. Biennenstock, B. F. Salzstein.

Moline, Ill.—Williams-McClean Garage Co., capital stock, $3,000; incorporators, C. H. Williams, W. R. McClean, A. G. Abraham.

Muncie, Ind.—Props-Brooker Motor Co., capital stock, $4,000; directors, J. Cooper, G. J. Brooker, O. P. Dunn, J. Brooker.

Nashville, Tenn.—Southern Zillo Co., capital stock, $100,000; incorporators, W. Hume, Jr., R. Dority, A. B. Foster, W. M. Fry, H. H. Reynolds.

New Orleans, La.—J. A. Landry Motor Car Co., capital stock, $25,000; incorporators, J. A. Landry, J. B. Avergo, R. J. Montrose.

Newark, N. J.—Vanderman & Wainwright Co., capital stock, $100,000; general motor car business; incorporators, F. L. Vandeman, J. S. Wainwright, H. C. Ruckle.

New York—Sternberg Motor Truck Co., capital stock, $25,000; to deal in motor cars; incorporators, E. M. Sternberg, E. P. Herman, B. Sternberg.

New York—Miller-Brisben Co., capital stock, $25,000; to deal in motor cars; incorporators, W. A. Miller, I. Jaffee, J. McNeil.

New York—Stegeman Motor Truck Co., capital stock, $25,000; incorporators, J. G. Anderson, J. G. Smith, J. A. Kent.

New York—Seager's Garage, capital stock, $1,000; incorporators, J. H. Seager, A. Seeley, H. B. Ecerson.

New York—Cahill Auto Works, capital stock, $6,000; incorporators, A. J. Cahill, H. J. Cahill, C. E. Trainer.

New York—Beaver State Motor Co., capital stock, $300,000; to manufacture motor cars; incorporators, P. Combs, J. L. Bailey, G. A. Johnson.

New York—Tuxedo Tire Co., capital stock, $8,000; incorporators, A. Hormann, E. Waltenberg, A. Waltenberg.

New York—Peets-Homan Corp., capital stock, $2,000; to manufacture and sell motors; incorporators, J. A. Bolles, C. S. Peets, F. D. Homan.

Norfolk, Va.—Allen Motor Co., capital stock, $2,000; incorporators, E. J. Allen, R. J. Allen, George Pilcher.

Philadelphia, Pa.—Perfect Tire Sales Co., capital stock, $45,000; incorporators, F. R. Hansell, G. H. B. Martin, S. C. Seymour.

St. Louis, Mo.—Muehling Motor Car Co., capital stock, $5,000; incorporators, F. W. Muehling, G. H. Muehling, G. Blumenthal.

St. Louis, Mo.—Maxwell Motor Sales Co., capital stock, $5,000; incorporators, J. Fillo, B. R. Ford, C. E. Darrow.

Warsaw, Ind.—Warsaw Automobile Co., capital stock, $4,000; directors, W. H. Stanley, John E. Armstrong, A. S. Windaman.